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The outdoor education program for sixth graders in San Diego County is described, along with an account of its development and the financial support structure underlying the program. Eleven major outcomes that can be expected from participation in the outdoor education program are enumerated. An intensive pre-camp teacher-training program carried on at camp is summarized. The instruction guide contains detailed information about all learning activities (democratic living in a camp setting, safety and health practices, outdoor science activities, conservation, and creative expression) in which children of the San Diego district participate during their camp experience. A glossary of technical terms used in the discussion of programs and practices at the camps is included. A related document is RC 003 276. (DA)

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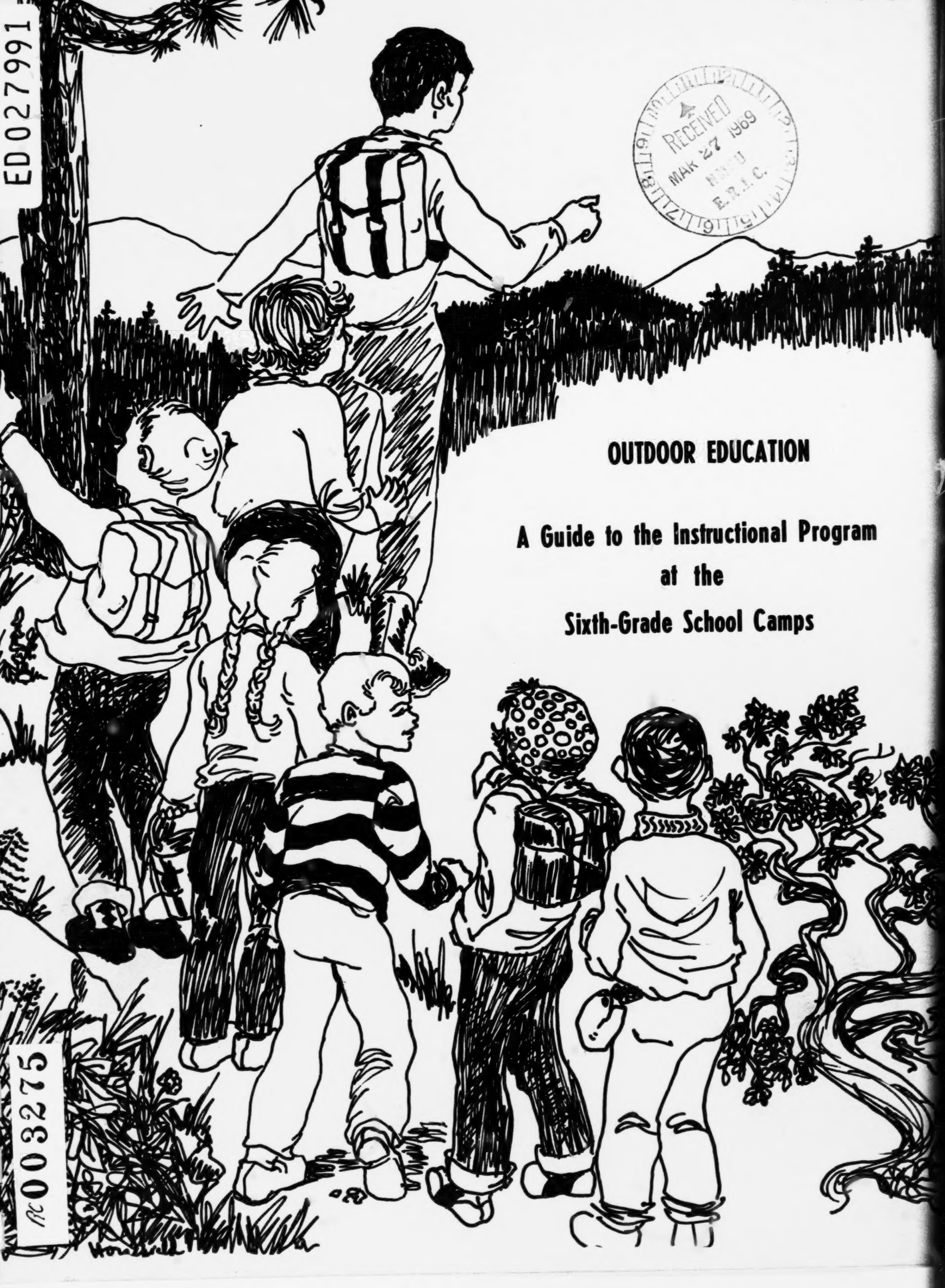

OUTDOOR EDUCATION

A Guide to the Instructional Program
at the
Sixth-Grade School Camps

RC003275

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OUTDOOR EDUCATION

A Guide to the Instructional Program at the Sixth-Grade School Camps

Prepared by

Denver C. Fox

At the request of

The Outdoor Education Advisory Committee

Consultant Committee

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San Diego City Schools
San Diego, California
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Unedited

PREFACE

The world in which children are living today is a technical world of push buttons, automation and remote control. Children no longer have adequate natural heritage wherein they can orient and relate themselves to simple, natural laws of cause and effect. Children need to have experiences that go beyond abstractions. They need to take part in activities in which understanding and a strong feeling of purpose grew from firsthand, real life situations.

The San Diego school camps are located in environments that offer many opportunities for such learning experiences. In a very real sense the school camp is a laboratory of learning.

Outdoor Education: A Guide to the Instructional Program at the Sixth-Grade School Camps is designed to serve the following purposes:

-Document the outdoor education instructional program.
-Act as a guide for camp teachers in implementing the outdoor instructional program.
-Orient classroom teachers to the outdoor education program.
-Interpret the outdoor education program.

Because the outdoor education curriculum is unique in the experience of most prospective outdoor education teachers, the descriptions of experiences and activities are presented in considerable detail in most instances. This will enable the teachers to use each activity write-up as a lesson plan.

The outdoor education instructional program is the result of the combined efforts and thinking of all the members of the camp staff who have worked in the program since its inception. It has been guided and directed throughout its development by the Outdoor Education Advisory Committee, representing the many participating school districts. Students and classroom teachers have helped to refine and guide the program through weekly evaluations of the program. Supervisors and directors of instruction have used the resources of their departments to contribute to the improvement of the program.

This documentation can be only a report of progress in a program where camp staff, Advisory Committee, classroom teachers and students continue to upgrade the program through experimentation and evaluation.

A companion guide, The Teacher's Guide to Outdoor Education, describes the school instructional program which utilizes the outdoor experience to add vitality and enrichment to the classroom program.

Wm. H. Stegeman
William H. Stegeman
Assistant Superintendent
Curriculum Services Division

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CHAPTER I

INTRODUCTION

OVERVIEW OF THE OUTDOOR EDUCATION PROGRAM

The outdoor education program in San Diego city and county is a program designed to utilize an outdoor and camp environment to more fully meet the growth needs of boys and girls.

Each week throughout the school year more than 410 boys and girls go with their classroom teachers to camps in the high mountains of San Diego County. There, under the leadership of credentialed teachers, they explore and learn about their new environment in an adventuresome and profitable learning experience.

For four and one-half days they work, study and live together in a camp and outdoor setting.

HISTORY OF OUTDOOR EDUCATION IN SAN DIEGO

Outdoor education programs were initiated in school districts in San Diego County in 1946. The participating districts received leadership in the development of their outdoor education programs from the Outdoor Education Advisory Committee. The membership of the advisory committee is representative of the districts participating in the school camp program.

SUPPORT OF THE OUTDOOR EDUCATION PROGRAM

San Diego City and San Diego County, through the San Diego City-County Camp Commission, provide and maintain capital facilities for operating the program.

The participating school districts are responsible for the instructional program. They jointly finance the salaries of the camp instructional staff.

The students and their parents pay for the cost of food and related expenses of operation.

CAMP AND CLASSROOM INTEGRATION

In general, a school district's program includes not only the experiences at camp but also the related pre-camp and post-camp experiences in the classroom. The point of view of the San Diego outdoor education program is that:

> "Outdoor education must contribute more to the school program than a week of outstanding experiences and learnings at camp. The great potential of outdoor education will not be realized until the impact of increased interest and understanding growing out of first-hand experience is brought to bear directly upon the classroom program of instruction. The outdoor education program should charge the classroom program with vitality and the pupils and teachers with enthusiasm that will result in an upgrading of instruction."

A description of ways and means of integrating the outdoor education program with the classroom program is presented in the Teacher's Guide to Outdoor Education.

THE SCHOOL CAMP: A LABORATORY FOR LEARNING

San Diego City and County schools use the school camps, operated by the San Diego City-County Camp Commission, as laboratories to provide opportunities for real life situations and purposeful, direct experiences in their respective educational programs.

Opportunities for Learning in the Camp Environment

The outdoor program at camp offers unique opportunities for meeting the growth needs of boys and girls. The twenty-four-hour-a-day camp living situation affords a new sociological as well as a new psychological and physical environment wherein desirable understandings and relationships can be developed.

1. The outdoor environment is rich in opportunities for first-hand, direct experiences that encourage students to discover and explore new interests in a spirit of adventure.

2. The outdoor environment introduces many new sensory experiences --- different odors, strange sounds, unusual textures, and interesting sights.

3. The simplicity of natural surroundings brings clearly into focus many fundamental laws and forces of nature that affect our way of living.

4. The beauty of the outdoors brings about a new quality of emotional and spiritual feelings and understanding.

5. In this climate of high motivation, strong purpose, and readiness for learning, the intellectual and spiritual horizons of young people can be widened.

The outdoor education program provides the opportunity for classroom teachers to plan with students for improved experiences at camp and, also, to use the camp and outdoor experiences to add vitality and enrichment to the school instructional program.

MAJOR OUTCOMES OF THE OUTDOOR EDUCATION PROGRAM

Some of the major outcomes that can be expected from participation in the outdoor education program are:

-The student gains meaningful concepts in natural and life sciences through actual experience in outdoor activities.

-Children, coming from seperate schools, different economic levels and varied social, racial and cultural groups, gain increased understanding and appreciation of each other as they live, work, study and play together at camp and in the outdoors.

-The student recognizes the worth of group action in planning solutions for problems in camp, sharing ideas, setting standards, and evaluating the results of planned activity.

-Pupils and teachers gain new insights and discover each other as individual personalities in the outdoor experiences. Their increased understandings improve subsequent classroom relationships.

-The child finds a deeper sense of serenity, inspiration and spiritual well-being as he becomes aware of the beauty, the majesty, and the exquisite order of his natural surroundings.

-The child feels an added sense of worth and importance as he engages in altruistic enterprises that contribute to his fellows, to future campers, and to people in his community.

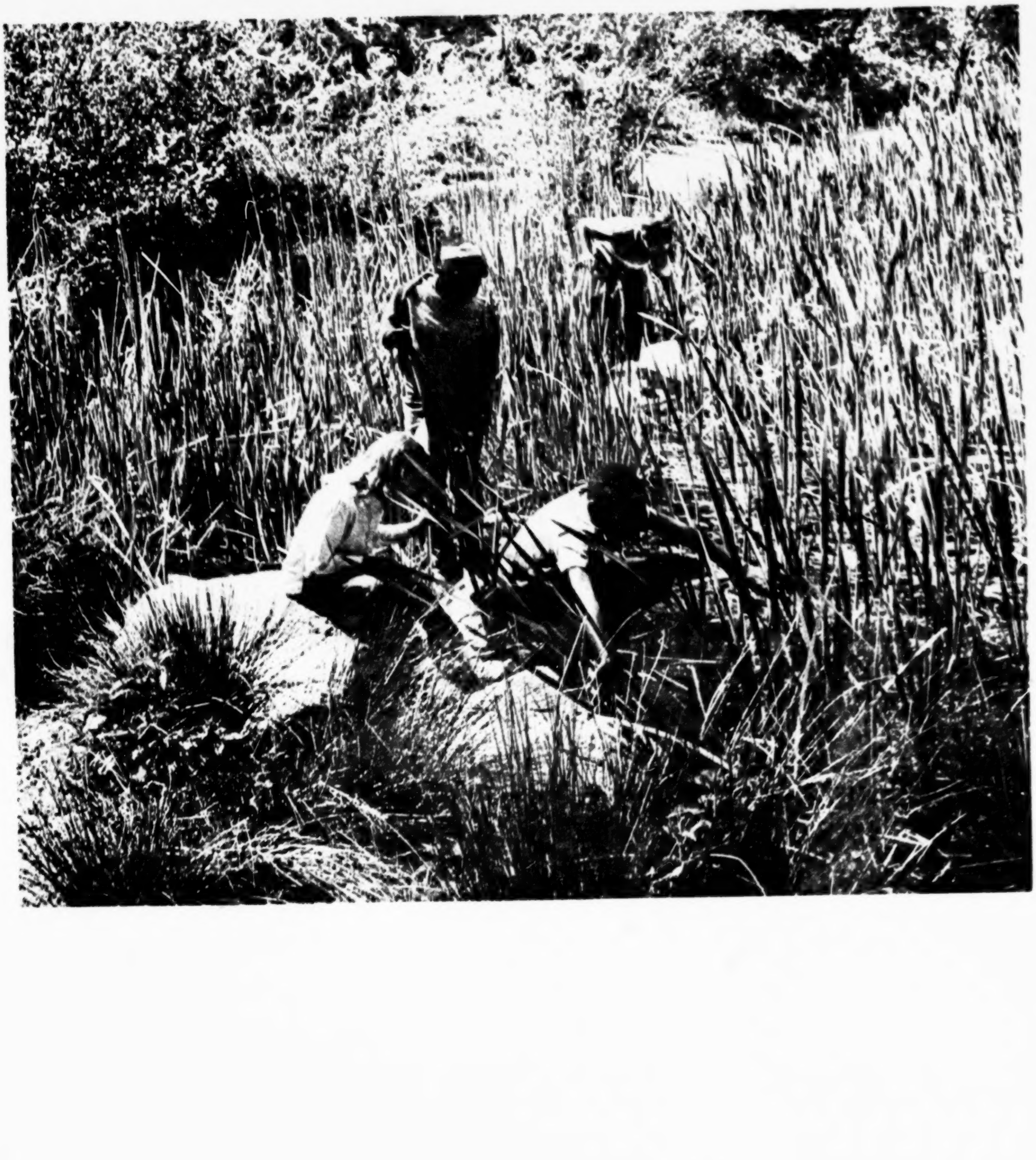
-The child gains a feeling of self-dependence and growth as he masters new skills and learns to take care of his needs.

-The student appreciates the physical satisfactions and dignity of working with his hands.

-The child expresses himself creatively through new experiences in music, language and art.

-The student acquires a proprietary interest in conserving natural resources as a result of working on conservation projects.

-The child gains fuller understanding of the importance of good health habits and safety practices.



CHAPTER II

THE OUTDOOR EDUCATION TEACHER: A PROFESSIONALLY TRAINED LEADER

Most teachers in the outdoor education program have had experience in classroom teaching. As credentialed teachers, all are assumed to have the training necessary for competence in teaching children.

TRAINING FOR A UNIQUE PROGRAM

Teaching children in an outdoor and camp environment involves areas of learning and aspects of teaching that are not ordinarily included in the usual teacher-training program. For this reason, an ambitious inservice education program is planned for the camp staff.

During the first two weeks of the school year, an intensive pre-camp training program is carried on at camp. During this period the resources of the experienced staff are joined with experts in related fields to offer a "learn-by-doing" approach to all aspects of the outdoor education program.

Throughout the school year, one of the two staff meetings held each week at camp is devoted to strengthening the effectiveness of camp teachers in the outdoor education program.

The staff library at each of the camps includes many good reference books for research and study.

USING EFFECTIVE METHODS OF INSTRUCTION

The special nature of the outdoor education experience makes it desirable to emphasize certain aspects of teaching that can lead to a fuller realization of the potential values of the week at camp. A brief outline covering some of the methods and techniques of teaching that are especially pertinent to the outdoor education program is presented here as a guide to improved instruction.

Learn why children behave as they do.
- -Read to gain background information.
- -Consult with classroom teachers about pertinent behavior of children from their school.
- -Study behavior information supplied by the school.

-Gain insight into childrens' needs and drives for:
  - security
  - recognition
  - success
  - activity
  - altruistic expression

-Develop a sensitivity that will aid in:
  - reading faces, expressions
  - sensing moods, tone, atmosphere and attitudes
  - sizing up situations

Know what goals and outcomes to strive for.

-Which attitudes to promote.
-Which skills and understandings to develop.
-Direction in which children need to be led.

Develop good teacher-student rapport by being:

-Friendly, sympathetic, humor-loving.
-Sensitive, understanding, alert.
-Objective, clinical.
-Constructive, positive.
-Consistent, dependable.
-Fair, honest, reasonable.
-Inspirational.

Know your subject well.

-Learn about the natural environment:
  - plants
  - animals
  - rocks
  - topography
  - weather
  - stars
  - relationships

-Learn about the cultural environment.
-Learn the skills involved in the activities:
  - song leading
  - woodsmanship
  - craftsmanship
  - outdoor living

Develop good techniques of instruction by using those methods that are most effective in achieving goals established for the program.

-Teach by example.
-Practice democratic procedures.
-Plan carefully to meet the particular needs of the students and opportunities for the activity at hand.

-Encourage students to explore and make discoveries for themselves.
-Make use of the first-hand learning experiences found in the field activities to promote "learning by doing."
-Employ the problem-solving approach. Involve students actively in solutions to problems.
-Strive to promote creative thinking. Use questions that are thought-provoking.
-Use the scientific approach to learning.

WORKING TOGETHER AS A TEAM

One characteristic of the outdoor education program is the team approach to instruction. This team approach is one of the program's outstanding strengths because it leads to more objective evaluation, greater interest in all aspects of the outdoor education program, an equalized work load, and good inservice training opportunities.

-Each outdoor education teacher is a generalist rather than a specialist. He is responsible at one time or another for almost every aspect of the program.

-Each student is instructed at some time by almost every teacher. Camp teachers need to develop consistency of standards and methods in order to prevent students from feeling confused.

-Camp teachers are teamed together to be responsible for definite activities, cabin supervision, hikes, etc.

-Camp teachers are rotated so that at some time they are working with every other member as a team responsible for an activity.

WORKING FOR GOOD HUMAN RELATIONSHIPS AMONG STAFF MEMBERS

The personal life of the camp teacher is not entirely seperated from his professional life. In the typical office or school the worker leaves his relationships with his professional associates and goes home to more personal relationships with his family and close friends.

At camp, the teacher finishes his professional association with his co-workers, then takes a shower and dons fresh clothing to meet his fellow staff members in social relationships.

The implication of this kind of situation is that much attention and effort must be given to the development and maintainance of very good human relationships among camp staff members. It is possible for the staff members to enjoy each other and find many wonderful associations in their relationships at camp.

Suggestions for Improving Staff Relationships

Good staff relationships evolve when basic principles of good living are practiced. Perhaps the most important of these principles is to be considerate of others. This is especially important at camp because there are always so many "others" to consider.

The need for many persons to share common facilities highlights the need for consideration in many situations.

In the staff lounge:

-The chief purpose of the staff lounge is to provide a place where staff members can enjoy relaxation and diversion. The diversion may take the form of reading, playing cards or other social games, listening to music or just conversing.

-It is very important that the need for relaxation be recognized when staff members are engaged in activities that could become unduly disturbing to others.

-This consideration should extend to staff members in their own rooms who might be disturbed at inappropriate times by disturbances in the staff lounge.

In the staff kitchen:

-Just a little extra time and attention can keep the staff kitchen neat, clean and attractive. Some recommended practices are:

- Wash dishes immediately after using them.
- Store all foodstuffs properly.
- Discard all foods that may be spoiled.

In the laundry room:

-Washing facilities are provided at camp for incidental and emergency washing. The equipment is not the rugged commercial type and will not stand up under heavy loads or prolonged use. Therefore, no one should plan to do his laundry regularly at camp.

-Special attention should be given to the time the washing facilities are used so that:

- Hot water is not being used for washing at a time when it provides a drain on the supply for other purposes.
- The noise does not provide an untimely disturbance.

During activities:

-It is important for each staff member to feel recognized as a contributing member of a team. Steps should be taken to insure that one counselor does not make all of the decisions without consulting with others who share responsibility for the activity.

-Experienced counselors should be alert for ways of providing status for inexperienced teachers or teachers' aides. No one should be made to feel inferior in front of the students.

In personal relationships:

-A very valuable aid in developing desirable human relationships is to maintain good lines of communication. The ability to go to another person and discuss situations objectively often dissipates any reason for the development of problems.

-The use of tact in personal contacts does much to smooth over rough spots that might create heat through friction. Basically, tact involves the ability to project ones self into the other person's place. Tact requires a sensitivity of how people react to approaches. It requires some reflection upon the true goals and objectives involving another person. Is developing an improved relationship or is giving vent to anger the most worthwhile goal ?

-A very rewarding way of showing consideration for others is to give them the benefit of any doubt concerning questionable actions and withhold judgment until the facts have been made clear. Above all, do not contribute to rumor that might be damaging to another.

-There is still no substitute for the Golden Rule as a guideline for helping people to live and work in harmony.

WORKING FOR GOOD RELATIONSHIPS BETWEEN CAMP STAFF AND CLASSROOM TEACHERS

A major strength of the San Diego outdoor education program is found in the integration of the classroom program and the program at camp.

The classroom teacher plays a very important role in the integration process. His efforts in pre-camp planning, participation at camp, and post-camp follow-up do much to determine the attitudes of students and the extent to which they are able to profit from the outdoor experience.

The classroom teacher and the camp teacher are truly co-workers in the joint effort to provide worth-while experiences for children.

In the role of host, the camp teacher can do much to establish a desirable rapport by taking the initiative in making the visiting classroom teachers feel welcome. It is a wonderful opportunity to meet many fine teachers and have the satisfaction of taking the initiative in developing new friendships.

It is quite natural for classroom teachers to be a bit apprehensive and reserved as they come to camp, perhaps for the first time. However, experience has demonstrated that every teacher coming to camp wants to be friendly and cooperative.

The following actions can do much toward establishing a climate of friendliness. The camp teacher should:

-Step forward and introduce himself.

-Show an interest in the teachers. Don't allow a busy schedule to give the appearance of being too busy to be friendly.

-Include classroom teachers in social activities.

-Consult them for help with students. Ask them for background information and for opinions involving judgment about individual children.

-Practice the suggestions listed for improved staff relationships.

The experiences of children and teachers are always improved in a climate of cooperation, friendship and harmony.

CHAPTER III

THE OUTDOOR EDUCATION CURRICULUM: A PLANNED PROGRAM OF ACTIVITIES

It is not enough to take a child from one environment and put him in another. Plans must be made for maximum use of the assets of the new environment to promote desirable growth in attitudes, learnings and practices in mental and physical health, self-realization, and in human relationships. These plans constitute the curriculum of the outdoor education program.

The curriculum:

-Involves much action--working, playing, exploring, discovering, creating, conserving, sharing, investigating and evaluating.

-Is centered around the childrens' needs and interests.

-Includes experiences of many types; new and different experiences that broaden the horizon and stimulate new interests.

-Is close to the immediate environment--it is here and now.

-Includes experiences that are well integrated, cutting across many subject areas.

Woven into the fabric of living at camp must be threads that appear now in this pattern and again in another in varying relationships with many other threads. Some of these threads that must be woven into the curriculum are: learning, orientation, health, spiritual needs, recreation, self-expression, purposeful work, self-reliance and democratic action.

NEW EXPERIENCES IN A NEW ENVIRONMENT

In this curriculum boys and girls study new and different books. These living books are: the hills, the valleys, the rivers, the heavens, the plants and animals, and the camper group.

The materials used are the materials of the environment:

-Clay dug from the old Indian claybank.

-Alabaster brought to camp from the near-by desert foothills.

-Rocks and minerals.

-Manzanita and wild lilac wrested from the chaparral-covered hills.

-Pine cones, bark, lichen, seed pods, incense cedar and pine, all brought from a morning's excursion to be used in creative work and expression later in the day.

The tools are the basic hand tools of the woodsman and craftsman: knives, axes, shovels, saws, files, chisels, hammers, drills, glue and sandpaper.

The equipment is that of the discoverer: maps, compasses, telescopes, binoculars, microscopes and magnets.

The methods are those of the scientist: exploring, discovering, collecting, recognizing problems, planning, cooperating, proposing, testing, investigating and evaluating.

In this classroom that has no walls, using the above materials, tools and methods, a vital program of living, learning and working together shapes a purposeful experience curriculum.

THE INSTRUCTION PROGRAM

The following outline presents a brief overview of experiences included in the outdoor instruction program.

I. Experiences in Natural Sciences

- A. The heavens
    - 1. Studying the stars and going on night hikes.
        - a. Finding constellations using portable planetariums.
        - b. Learning legends about the constellations.
        - c. Observing the planets, moon and stars through telescopes.
        - d. Studying sun spots projected by telescopes.
    - 2. Studying telescopes and their uses.
    - 3. Visiting an observatory and museum.
    - 4. Learning to use stars to determine direction.
    - 5. Viewing films about astronomy.
- B. Weather and Climate
    - 1. Discussing the importance of weather to the camp environment, plants, animals and campers.
    - 2. Using the camp weather station to observe, measure, record,

report and predict.

3. Discussing clouds, rain cycle, wind.

4. Developing a "fire hazard index" to determine if camp activities such as cookouts, campfires and burning can be carried on safely.

C. Rocks and Minerals

1. Studying the geological history of the outdoor area.

    a. Examining roadcuts, kinds of rocks.
    b. Developing an exhibit of local rocks and telling the story of their origin.

2. Discussing how the soil has been formed and studying soil profiles.

3. Learning the mineral resources of the outdoor area.

    a. Visiting nearby mines.
    b. Making a collection of mineral-bearing rocks.
    c. Using camp "mineralight" to study fluorescence.
    d. Using the Geiger counter to study radioactivity.

D. The Topography of the Land

1. Observing mountains, valleys, ridges, watersheds, divides, mesas, buttes and terraces.

2. Discussing formation, function, effect, and characteristics of land forms.

3. Studying problems of the land.

E. Water

1. Identifying the source of water found in the area--rain, streams, lakes, reservoirs, wells, springs.

2. Discussing the importance of water and man's responsibility for protecting the water shed.

3. Discussing the importance of the local area as one of the sources of water supply for farms and cities.

4. Tracing the camp water supply.

5. Observing the work of water.

F. Living Things

1. Studying the many interrelationships and interdependencies of living things.
    a. Dependency upon basic resources: soil, air, sunlight and water.
    b. Carbon dioxide cycle, photosynthesis, food chains.
2. Discussing the ecology of living things.
3. Learning about characteristics and functions of the different kinds of plants, insects, birds and animals observed.
4. Using instruments and equipment in the camp science laboratory.
5. Discussing man's relationship to his natural environment and his responsibility for wise use of the resources so abundantly provided.
6. Learning how the Indians made use of their environment.

II. Experiences in Conserving Natural Resources

A. Hiking to explore and observe natural resources.

B. Listening to nature talks.

C. Studying nature and exhibits in the camp museum.

D. Learning and abiding by rules and regulations of the State park system and United States Forest Service.

E. Practicing sound conservation procedures--good sanitation in forests and streams and lakes, picking up litter.

F. Using natural resources wisely--following thrift and conservation principles in collecting craft materials.

G. Working to improve and conserve natural resources.

1. Controlling soil erosion - wattling and building dams, retaining walls, diversion berms, gully plugs, and rock aprons.
2. Collecting and propagating seeds; nursery work.
3. Collecting wildlings (wild seedlings) for transplanting.
4. Planting seedlings: potted and/or bare root stock.

5. Providing Fire Protection

   a. Clearing debris and grass from danger spots.
   b. Learning and practicing good fire prevention and suppression techniques in cookouts and slash-burning operations.
   c. Reducing fire hazard by removing slash (limbs) and duff (leaves) from ground cover.
   d. Removing snags that attract lightning.
   e. Pruning dead limbs from trees and chaparral.
   f. Improving firetruck trails

6. Improving Timber Stands

   a. Thinning dense stands.
   b. Removing "weed" trees.
   c. Pruning mistletoe.

7. Improving grazing land--clearing land of debris so that grass may grow.

8. Working on beetle control projects--cutting, limbing and treating trees to kill beetles.

9. Helping with bird and animal surveys.

10. Feeding wildlife in heavy snows.

11. Providing watering areas for wildlife.

12. Developing and maintaining trails.

III. Work Experiences

A. As a part of the camping activity.

   1. Cleaning cabins, activity rooms and campgrounds.

   2. Washing dishes and setting tables.

B. As an effort to improve the camp program.

   1. Constructing bridges, retaining walls, council meeting area, and weather stations.

   2. Fireproofing high-hazard areas.

   3. Collecting special craft materials.

C. As an effort to improve the forest environment--working on conservation projects. (See section on conservation experiences.)

IV. Social Living Experiences

A. As a member of cabin groups (living together 24 hours a day--rest period, showers, cabin cleanup, planning, sharing, evaluating.)

B. As members of activity groups--square and folk dancing, dramatics, games and stunts.

C. As members of the total camp group:

1. Activity meetings.
2. Evening programs.
3. Free choice and games periods.
4. Group singing of camp songs.

V. Arts and Crafts Experiences

A. Craft hikes to study, appreciate, and sometimes collect materials.

B. Craft work in shops.

1. Modeling native clay that has been found in the area and processed by students.

2. Arranging lichen, twigs of chaparral and bark to make miniature scenes or dwarf gardens.

3. Rock carving in massive gypsum (alabaster) or soapstone.

4. Making dried weed and flower arrangements.

5. Carving and fashioning objects of wood, pinecones and other forest products.

6. Making plaster of Paris casts of animal tracks, leaves and flowers.

VI. Music Experiences

A. Singing camp songs.

1. At general meetings, activity meetings, evening programs.
2. On activities, hiking, working, etc.
3. In the cabins.
4. At mealtime, in saying grace, and when washing dishes.

B. Listening to "mood" recordings during rest time, bedtime, meals and camp and work experiences.

VII. Experiences in Physical Education and Recreation

A. Square dancing
B. Fishing
C. Stunts
D. Tumbling
E. Games
F. Contests
G. Snow sports
H. Hiking

VIII. Experiences in Democratic Practice

A. Planning for enjoyable and safe living in cabins.

B. Establishing standards of courtesy, consideration and conduct.

C. Discussing and attempting to solve problems at camp.

D. Making choices of activities--activity signup.

E. Sharing experiences.

F. Evaluating experiences.

G. Making decisions about the program.

IX. Outdoor Skills Taught in the Camp Program

A. Use of compass and map.

B. Use of "Mineralight."

C. Use of Geiger counter.

D. Ore panning (mining.)

E. Use of planetarium.

F. Fire building and outdoor cookery.

G. First aid procedures.

H. Use of craft and conservation tools.

I. Animal tracking.

J. Survival techniques.

K. Use of weather instruments.

L. Use of telescopes and field glasses.

M. Use of microscope and magnifying glasses.

N. Use and care of fishing equipment.

Variations in the Program

The activities program will vary at each of the camps because of the differences in the physical plants and the surrounding environments. However, all of the basic learning experiences will be included in each of the camp programs. These are described in the camp teacher's guide, Outdoor Education, which may be found in the camp kit.

In planning with the students for participation in the outdoor education program, the teacher should bear in mind that specific activities may not be available during the week for one of the following reasons:

1. Changes in weather--snow, rain, wind. (Cookouts and all day hikes may be canceled. An inclement weather program may be in effect all week.)
2. Changes in season:

    -Trees can be planted only during a short wet season.

    -Snakes or cattle may rule out certain hikes.

3. Special conditions:

    -There may not be an active beetle problem to control.

    -Flood or fire conditions may offer special opportunities.

    -Illness may limit the program.

There is less chance for disappointment when the camp activities are planned in general terms and on a tentative basis.

In order to get up-to-the-minute information about the activities, the class might write to camp to have questions answered. Requests for information are mailed to the camp several weeks prior to the encampment.

THE SCHEDULE OF CAMP AND OUTDOOR ACTIVITIES

The sample weekly schedule for the camps, page 19, gives an overview of the week's activities and shows the sequence of experiences throughout the day. Changes may be made in the schedule because of weather, seasonal interests, and unforeseen emergencies. The schedule provides a framework from which to depart. In general, the schedule of time periods will be adjusted to have students rise earlier in spring and fall and later in the winter.

SCHEDULE OF WEEK'S ACTIVITIES AT THE SCHOOL CAMPS

Time	Activity	Monday	Tuesday	Wednesday	Thursday	Friday
						Pack and clean-up
6:30	Reveille					
7:15	Breakfast gong					
7:30	Breakfast dishes					
8:15	Cabin cleanup					
8:50	Flag raising		Song and pledge	Song and pledge	Song and pledge	Conference with teachers
9:00	Morning assembly	Staff meeting	Singing Weather reports Nature lore Divide groups	Singing Nature lore Divide groups	Singing Nature lore Divide groups	Square dancing Museum Craft "Woodquiz Scramble"
9:30	Morning activity	Arrival of campers	Conservation activities Observatory and mine Nature hike Craft Hike Crafts Ecology	Conservation and observatory Nature hike Craft Hike Crafts Mining Ecology	Conservation and cookout Observatory and mine Nature hike Astronomy Pond ecology Geology	Geology Ecology
11:30	End of activity	Divide campers into living groups				Lunch
	Washup					Singing
11:45	Lunch gong	Orientation				Departure of campers
12:00	Lunch					Counselors check and close camp
to 1:45	Rest	Orientation of campers				
1:45	Afternoon assembly	Health inspection	Singing Sharing Nature lore	Singing Sharing Nature lore	Singing Sharing Nature lore	
2:00	Afternoon activity	Orientation of teachers	Crafts Geology	Crafts Mining Fishing	Crafts Geology Pond ecology Fire protection	
4:00	End of activity	Camp exploration hike				
	Leisure of games					
4:00	Showers & signup					
5:15	Supper gong					
5:30	Supper					
6:30	Special interest		Astronomy	Astronomy		
6:50	Evening program gong	Story of the forest	Indian ceremony	Sharing experiences	Skits or star hike	
7:00	Evening program			Frontier games	Evaluation session	
8:00	Wash and to bed					
8:30	Story					
9:00	Lights out - quiet					

CHAPTER IV

LIVING IN THE CAMP COMMUNITY

THE CAMP COMMUNITY: A SETTING FOR DEMOCRATIC LIVING

An important potential of the camps in the school educational program lies in providing children with a real life setting for practicing the skills of living together in a democratic social group.

Some of the important characteristics of the camp community are uniquely different from the usual school and the camp setting is carefully planned to meet the objectives of the program.

- -It provides a 24-hour-a-day living situation.
- -It offers a new physical, sociological and psychological environment.
- -It is a community of children.
- -It is carefully structured to meet certain basic objectives.

Structuring of the Camp Community

1. Children are selected from the same grade level because they tend to have similar needs, drives, abilities and points of view.

2. Some of the campers are friends while others are strangers.

3. The children come with varied backgrounds of race, religion, culture, economic status, home life and school life.

4. The campers are assigned to cabins so that some children from every school are in each cabin. The social pattern that existed in the classroom is temporarily dissolved to set the stage for new adjustments and relationships at camp.

5. The campers are removed from home and community contacts for five days.

6. The camp staff has special training for achieving the objectives of the program.

7. The classroom teacher comes to camp with his class for the week.

DEMOCRATIC ACTION: A WAY OF LIVING TOGETHER AT CAMP

The new setting of a children's community in a climate of real life activity provides a unique opportunity to develop desirable democratic action and attitudes.

The unexplored environment, the new home, new acquaintances and different experiences provide a timely opportunity for children to discover that new decisions, rules, standards and planning must be arrived at somehow.

It is a time and place where the camp staff can capitalize upon the child's recognition of need for action. It is a time to initiate planning and discussion that have the very real and immediate purpose of answering such questions as:

- Where will we live?
- How can we live well together for a week?
- How can we have the most enjoyable and profitable encampment?
- What rules and regulations should govern our behavior this week?
- Do we want to have the opportunity and responsibility for making most of our own decisions and standards?

Leadership in Practicing Democratic Action

The most efficient means of promoting democratic procedures is to practice them as a way of living.

The camp teacher's leadership will be exerted most effectively through his example. The camp teacher must believe firmly in democratic action as the most effective and efficient way of living together. He must exemplify his belief in his relationships with students. His manner, speech and actions must consistently carry the conviction of his belief.

The camp teacher will encourage children to accept the responsibilities of good citizenship as a requisite for enjoying the benefits of democratic action.

The point has been made that the planning, decisions, rules and standards formulated by one group is often so similar to those of groups in other encampments that it seems like busy work or pretense when the teacher leads a group in discussion and planning.

Of course, this is always a danger. If the thinking and planning are really the teacher's and not the student's, then, assuredly, time is being wasted and the children are gaining a distorted concept of democratic action as a purposeless sham. If, on the other hand, the teacher is skilled and wise enough to promote original, creative thinking on the part of students, he is building a solid basis for democratic action.

It is important for the teacher to ask himself, "Are the children really doing the thinking? Do they sincerely feel that the decisions are their own? If the answer is "yes", then the children are likely to have a strong feeling of proprietorship in their plans and decisions. Their decisions become a point of reference against which future action and behavior can be measured. Their rules and standards become guidelines, which they may change, defend or build upon as they see fit.

Leading students in democratic action requires much skill, careful planning, and continous reflection. Some teachers may feel that there is good democratic action taking place just because the campers are assembled and are talking. Such a laissez-faire practice will probably result in minimum growth because of lack of mature direction. Remember, the teacher is not one of the students. He is the leader.

The effective teacher will be an interested participant in the discussion. He will avoid dominating the thinking. His guidance will be exerted primarily through questions that challenge, promote deeper thinking, or lead in new directions.

DISCIPLINE: ACCEPTANCE OF RESPONSIBLE CITIZENSHIP

The concept of discipline in a democratic society implies the acceptance of responsibilities of good citizenship. The concept goes beyond the usual definition of control, even when developed as self-control.

Discipline is concerned with attitudes, motives and spirit.

In the school camps the special emphasis on democratic action influences the nature of discipline. Discipline is an integral function of the democratic process. It is the acceptance of responsibility and the exercise of self-control that enables campers to enjoy the benefits of their decisions and choices.

Discipline Based on Democratic Principles

The camp teacher's approach to desirable practices in discipline at camp is based on the following democratic practices.

-Use positive methods of guidance which exemplify a belief in the value of each personality, rather than negative methods which undermine self-confidence and self-esteem.

-Give evidence of confidence in the capacity of all children to learn cooperation and mutual respect.

-Promote a climate in which mutual respect and trust are encouraged.

-Use rational approaches to the solution of problems.

-Help campers understand the reasons for their own and others' behavior. Help them develop more effective ways of meeting and heading off conflicts and problems.

-Deal with behavior disturbances as symptoms of the child's personal problems. Look furthur and deeper for the real problems. Use the following resources for gaining additional information:

- Maintain good communication with other camp personnel about campers' behavior. Work as a team.
- Refer to written information about students supplied by school.
- Confer with classroom teachers who are at camp.

Guidelines and Suggestions for Achieving Good Discipline at Camp

1. Take time to establish, through example, environment and discussion, a good tone of rapport.

2. Develop a feeling of group spirit in which each camper feels an identification with and a pride in membership in the group.

3. Be courteous, kind, patient and sincere. Promote an attitude of honesty and consideration for others.

4. Emphasize the advantages of the campers being able to participate in determining the rules and the standards that are to guide their conduct for the week.

5. Lead the students in developing a set of rules and standards as guidelines.

6. Endeavor to involve all children actively in discussion of proposed rules and standards.

7. Clarify the responsibility of each individual in adhering to the rules and standards finally accepted by the group.

8. Offer the point of view that at camp individuals have the initiative in demonstrating how much self-government and self-control they can handle.

9. Explain that since the camp staff has responsibility for providing a safe and profitable experience for all campers, no individual or group can be allowed to jeopardize the safety and learning opportunity for others.

> Since many of the camp activities contain a real element of danger, it may be necessary to modify the program for any children who demonstrate that they are not willing or capable of accepting the responsibilities required for particular activities. In such cases campers may be referred to the head counselor or camp principal for furthur study. The camp teacher will not take it upon himself to decide on modifications of camper's programs.

10. Be alert to the early identification of any symptoms that may indicate potential behavior problems.

11. Communicate to other members of the cabin supervision team all pertinent information that may be useful in making a team approach to good discipline.

12. When infractions of rules or standards occur, withhold judgment, and review them, with individuals or with the group, in the light of the decisions accepted by the group.

13. Be judicious in the use of group social pressures to influence behavior. Do not use group pressure as a weapon, a threat or for punishment. Give guidance to group thinking to promote a rational, fair and helpful approach to the problem at hand. The wise use of group action can do more than solve individual problems. It can help to develop a feeling of pride and growth in children as participants in responsible citizenship.

14. Be prepared for activities. Avoid periods of confusion that result from not having materials and plans ready.

15. Anticipate ! Learn from experience. Remember how children react to situations and guard against situations that are likely to present problems in discipline.

16. Discipline yourself to use the manner and tone of voice that will be conducive to attaining your objectives with the children. Do not allow anger or destructive emotion to show. Be objective. Avoid letting personal emotions get in the way. Sarcasm and ridicule tend to destroy individual self-esteem and should never be used.

Responsibility for Discipline at Camp

The Camp Principal - The camp principal, as chief administrative officer of the camps, has authority over all students attending camp. He is responsible for maintaining standards of behavior and has full responsibility for the program and conduct of the school camps. He may delegate certain responsibilities to the Head Counselor but he is still responsible.

The camp principal will have a continuing responsibility for the resolution of all camp problems.

The Head Counselor - The head counselor is designated as the principal's representative and as such has delegated responsibility and authority for the program and operation of the camp within the framework established. He will deal with the problems arising from the normal operation of the camp program.

The head counselor is immediately responsible to the camp principal and will keep him fully informed about problems of camp operation. All problems of an unusual nature will be brought to the immediate attention of the camp principal.

The Camp Teacher - The camp teacher is responsible for the behavior of students who engage in the activity which he is assigned to supervise. He also has responsibility for the behavior of any other students who may not be under the immediate supervision of another teacher.

The camp teacher will work closely on activities with the classroom teacher. Though the final responsibility for the conduct of an activity rests with the camp teacher, the classroom teacher does not relinquish responsibility for his students just because they are at camp.

The camp teacher is directly responsible to the head counselor in matters pertaining to the day-by-day conduct of the outdoor education program.

Rules and Procedures Governing the Handling of Discipline Problem Cases

Corporal Punishment - No corporal punishment shall be used for any reason in the outdoor education program.

Control by Force - The only time a child may be restricted forcibly is when such restiction is necessary to insure the safety of himself or others. Any necessary control by force must be done objectively and without anger.

Exclusion from an Activity - A student should be excluded from an activity only after all other means have been exhausted. The child should never be allowed to remain in any situation where he is unsupervised. Lack of supervision is the chief factor in determining negligence.

If the camp teacher finds it necessary to send a student to the head counselor for furthur discussion or treatment of a problem, he should give the child a short note explaining the nature of the problem. If it is impractical for the teacher to take the child to the office, a dependable child should be selected to accompany him. The head counselor must have some information from the teacher in order to deal with the child's problem in a helpful way.

The camp teacher should discuss the situation with the head counselor at his earliest convenience.

Camp teachers do not bear the responsibility for modifying a child's program of activities. This is the province of the head counselor and camp principal.

The responsibility for returning a child to his school or home rests with the camp principal. All cases in which such action is recommended must be referred to the camp principal.

SPIRITUAL VALUES IN THE OUTDOOR EDUCATION PROGRAM

Point of View Regarding Opportunities for Spiritual Reflection and Expression in the Outdoor Education Program

The outdoor education program is a 24-hour-a-day experience that runs continuously from Monday morning to Friday afternoon. The program goes beyond what might reasonably be construed to be the school day to include aspects of living that are primarily the responsibility of the home. In a sense teachers assume the role of parents while the campers are in their care. The teachers have a responsibility for encouraging and improving good health habits of personal cleanliness and sleep. The camp staff also has the responsibility for allowing campers to continue cultural and spiritual traditions that have been carried on regularly in the campers' homes. It is believed that staff members do not have the right to deny children all opportunity for spiritual reflection or expression for the five days they are at camp.

Those camp experiences that are specifically planned as opportunities for spiritual reflection, expression, or observance are:

1. Religious worship on Sundays and Thanksgiving.
   There are one or two encampments each year that include Sunday. On these Sundays, children of Catholic faith are transported to the nearest Catholic church for morning Mass. The remainder of the children may or may not participate in a simple non-denominational ceremony held out-of-doors. The program is planned by counselors of representative faiths. The theme of the program is the wonder and beauty of the out-of-doors.

   Thanksgiving is treated in a similar way except that the central theme, of course, is that of Thanksgiving.

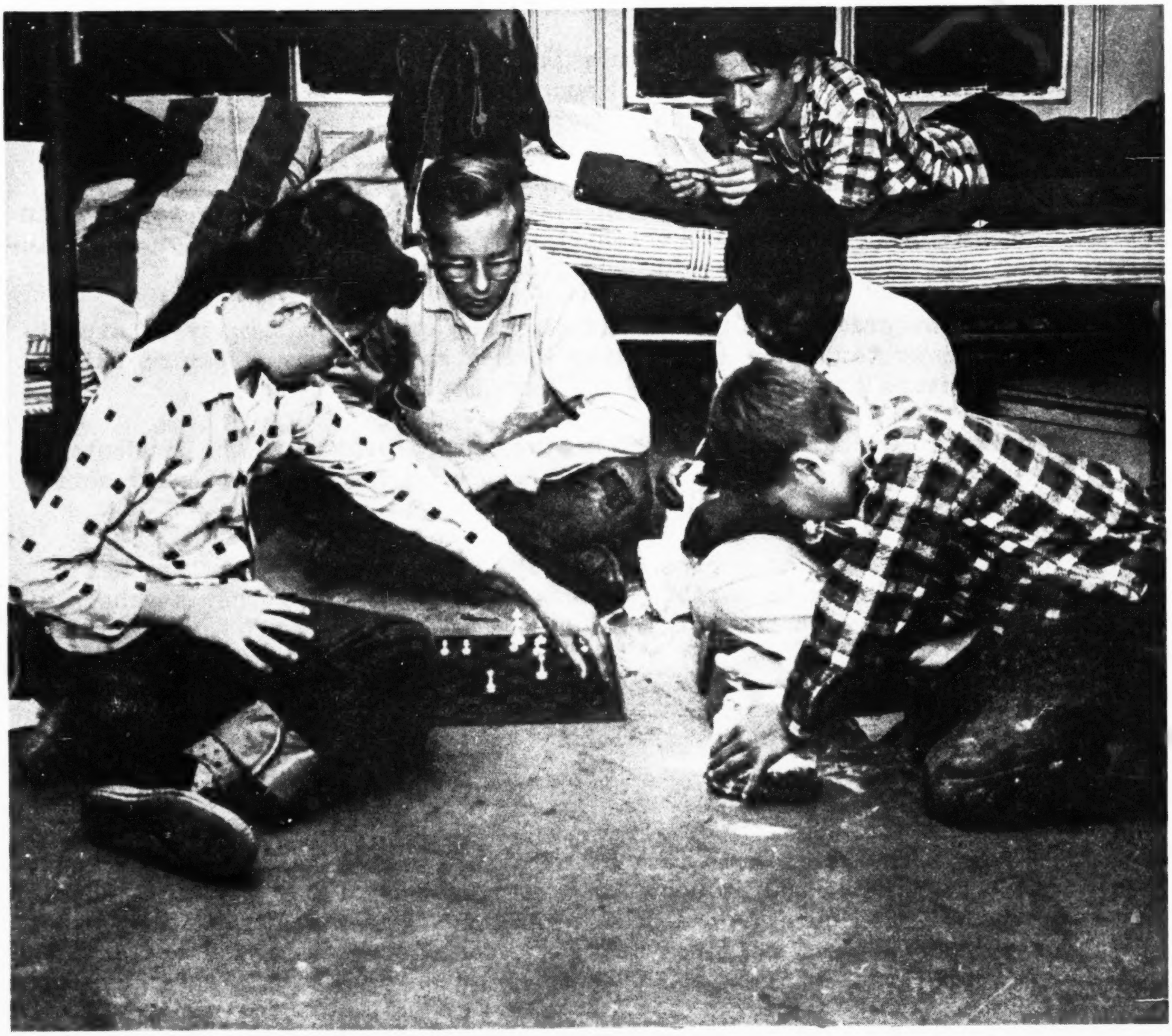
2. Religious holidays.
   Special menus are provided for religious holidays in addition to the main menu which is not modified for any religious reasons.

3. Christmas music.
   The camp follows district policy.

4. Grace before meals.
   A camp counselor makes the following statement to the campers before meals: "Here at camp some of us like to sing grace before meals. Any of you who wish may join us and are welcome to do so." There is no attempt to teach the grace. It is not sung a second time for them.

5. Religious reflection at the end of the day.
   Just as the campers go to bed, the cabin counselor may remind them that if any of them wish to say their prayers in their own way, this might be a good time for them to do so. A short quiet time for such reflection and prayers is provided with no further comment by the counselor.

It should be emphasized that at camp there is concern for providing opportunities for children to continue to follow some of their established home patterns while they are at camp. There is no attempt to urge, lead or teach any religious expression.



CHAPTER V

GETTING ACQUAINTED WITH THE NEW ENVIRONMENT

ORIENTATION

The program of orientation at camp is designed to help each child find himself in his relationships to his fellows, the camp environment, the natural environment, and the activities to be carried on in the new environment. Orientation is done through:

- Discussion
- Demonstration
- Explanation
- Observation
- Use of films, museums, displays, charts, signs, tours, tools

The greatest emphasis on orientation will come on the first day with the arrival of the children. Each succeeding orientation should serve to reinforce and supplement the important points already considered. Needless repitition can be avoided through good planning and teamwork.

There should be a planned orientation or approach to every activity in the program. In general, orientation should not be given for a particular activity until time for engaging in that activity.

One of the practices of good planning for smooth continuity of experiences is to terminate an activity with a short planning period which will prepare the students for the next activity.

Orientation should include the active participation of the students in determining objectives, standards and procedures for particular activities.

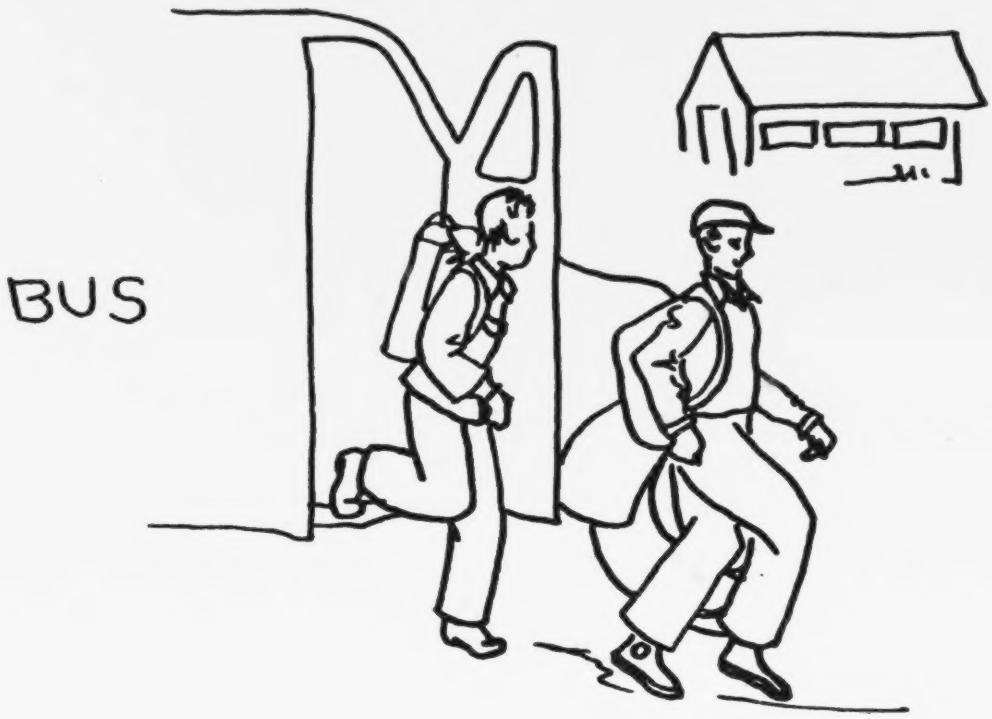
Orientations tend to become too wordy. The teacher should try not to talk the students to death. He should remember that other teachers will also be talking to the children. He should be prepared to vary his approach as he notices any symptoms of attention lag. Suggestions for improved group discussions are included in the section on language.

ARRIVAL AT CAMP

Point of View

Many boys and girls come to camp with some apprehension. Camp is new, it is different, and it contains some elements of the unknown. Some of these children come from a background where uncertainty and insecurity of home conditions heighten their apprehension. For these children the most important contribution that the outdoor education program can offer is a week of friendly, sympathetic acceptance which leads them to feel that they belong.

The child's first impression of camp should be that friendly camp teachers are genuinely glad to welcome them. They need to feel that they are wanted at camp.



Overview of Activity

When the buses arrive at camp they are met by teachers who escort the children immediately to toilet facilities. If time allows, the campers assemble for words of greeting, singing, and assignment to cabins. If time is short, children go directly to the dining room for lunch.

Expected Outcomes

The children feel:

- Welcome at camp.
- Reassured by the friendly, courteous and sincere manner of the camp teachers.
- A sense of security when the first concern of the camp staff is to provide for their physical needs.

Materials

Camp teacher's name tag for identification.

List of names of campers assigned to each cabin group.
Colorful clothing appropriate to the outdoor setting.
A smile and a sincere friendly manner.

Suggested Procedures

Before campers arrive:

- Learn at staff meeting about special characteristics of the incoming group or of individuals within the group (special, adjustment classes, gifted, etc.)

- Study summary statement of significant health and behavior characteristics of individuals, especially those assigned to your cabins.

- Decide early which teachers will meet the buses so that there will be no delay.

- Decide if time will allow for a general meeting before lunch.

The teacher boarding the bus should be mindful that this is the childrens' first contact with the camp staff. They will be looking for clues concerning acceptable standards and attitudes to be established.

- Be friendly and businesslike.
- Say nothing until the bus is entirely quiet.
- Introduce yourself.
- Give brief welcome.
- Explain procedures for leaving the bus.

  "Wait until the seat in front of you is vacant before you leave."

  "The boys will meet with ______ here. The girls will meet with ______ over at this place."

- Check with bus driver for any special instructions about time of bus departure. Ask driver for any additional health sheets or lists.

Boys should go with a man teacher to boys' toilet room. Girls go with a woman teacher to girls' quarters.

If buses arrive too late for general meeting, the groups should move leisurely to the dining room. Since the children have been seated for some time on the bus, they should have a chance to stretch with a short walk before lunch.

Before entering the dining hall, the children should be oriented as to where they might sit, how they should move and the need for quiet tones inside. Furthur orientation and procedures for meals, table counseling and dishwashing are described in the section on living and working together.

Before the meal is ended, the campers should be informed about the activities which will follow the meal.

At the general meeting for cabin assignment (either before or after lunch):

- -Sing some camp songs.
- -Continue to make children feel welcome at camp.
- -Divide group into smaller cabin groups by reading names from prepared cabin list.
- -Take group to cabin for cabin orientation.

CABIN ORIENTATION

Point of View

The cabins are to be the new homes for the campers for a week. The camp teachers take on the very important role of parents in absentia.

Each child needs to feel that this new home and the new set of adults he will be associated with offer him friendly security. He needs to feel that he is accepted by the other members of his new family of campers as a participating member.

The first cabin group orientation is an important opportunity for developing good attitudes and practices of democratic citizenship.

Overview of Activity

The campers meet with their teacher in the cabin to discuss how they can live safely and well together in their new home.

The standards and decisions arrived at in this group discussion should serve as a frame of reference and guide for future action and behavior.

Included in this first cabin orientation period will be selecting bunks, bringing in luggage and getting settled, depositing money and other articles for safekeeping, a health inspection, and a tour of the cabin facilities.

Expected Outcomes

The child;

- -Feels welcome in a friendly place.
- -Feels accepted as a worthwhile member of the group.

-Feels secure in knowing that he will receive protective care and understanding.

-Responds to the camp teacher's honest, sincere and straightforward manner.

-Enjoys a feeling of fellowship through belonging to a friendly group.

-Senses the spirit of "we" and "our."

-Considers his fellows with understanding and appreciation.

-Realizes the value of democratic action.

-Associates responsibility with freedom of opportunity.

-Desires to gain recognition in the eyes of his fellows through making contributions.

-Feels enthusiasm and anticipation for the experiences to come (a spirit of adventure and wonder.)

-Understands that camping and outdoor experiences are an important part of learning.

-Appreciates the need for order, organization and rules.

-Learns the names of his cabin mates and becomes acquainted with those who have been strangers.

-Helps to formulate cabin rules.

-Learns existing camp rules.

-Understands procedures for fire drills.

Materials Needed

List of children.
Health information.
Container for storing items for safekeeping.
Pencil.
Crayons.
Tagboard squares.
Hair pads.

Suggested Procedures

Introducing children:

Introduce the children to their new home by means of a brief tour (bunks, library, displays, shower room, toilets.)

Arrange the group in a pow-wow circle, each one sitting on a hair pad on the floor. Ask each person in the circle, including teachers, to introduce himself. Give a little historical background of the cabin and camp.

> ". . . Has served as a home for 6th grade campers for more than 18 years. Before that it was the home of young men in C.C.C. (Civilian Conservation Corps) who worked on conservation projects in this region. This week it will be our home. It looks like we have a pretty large family here doesn't it?"

Promoting desirable tone and attitudes:

Review suggestions for group discussions in the language section, page 191. "I am going to ask a question that each of you should think about for a while. In a moment I will call on some of you for answers. . . . . 'Why did you come to camp?'"

Possible answers to this question are to:

- Get out of school.
- Have some fun.
- Learn about nature.
- Get away from home.
- Go hiking.
- Meet new friends.

The answers will provide many opportunities to approach the problem of setting a tone, encouraging attitudes and identifying values and goals for the week.

Some of the answers may be expressed in a very negative manner. The teacher should be prepared to guide such sentiment into constructive channels. An example of this technique is suggested here:

To the answer: "Get out of school."

- Point out that camp is school--it really is a part of their regular school program. Otherwise they could not come to camp during school time.

- Ask them if they expect to learn anything during the week.

-Alert them to the fact that they will have a chance later to tell about some of the new things they have learned. "Let's decide then how good a school this week has been."

Some of the campers' answers will provide good leads for further exploration. One answer that never fails to show up is, "We came to camp to have some fun." Accept this as a very true and valid statement which naturally leads into the questions, "How can we have the most fun at camp?" "Do you mean fun for everyone or fun for just you personally?"

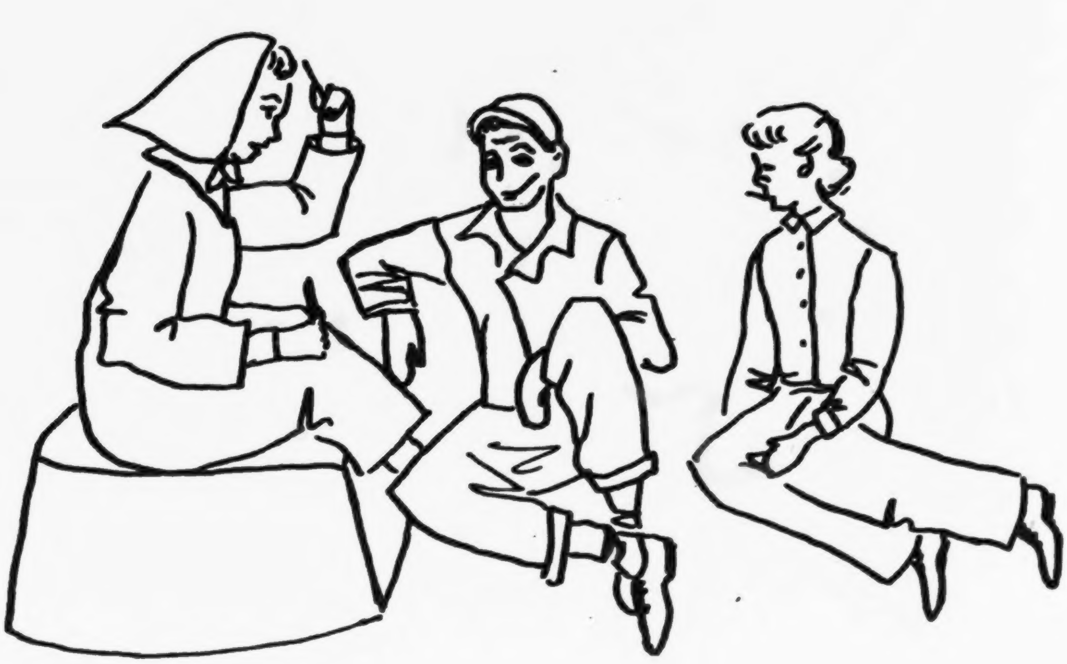
Show how the following can contribute to more fun for everyone at camp.

Keep safe and well - Ill or injured children may need to be taken home for treatment. Defer furthur discussion about this until the visit by the nurse.

Consider others - The Golden Rule leads to friendship and respect. Courtesy, cooperation and fairness encourage appreciation and fellowship. "The thing that goes the farthest toward making life worthwhile, costs the least, and does the most good is just a pleasant, sincere smile."

Inspecting campers for health conditions:

At some time during the cabin orientation the camp nurse will arrive to inspect the campers for symptoms of communicable conditions. Prepare the campers for the nurse's arrival before she appears. Introduce the camp nurse and encourage good nurse-camper rapport.



Work with the nurse in helping to read and record temperatures, and otherwise assist in inspection and supervision while nurse:

- -Encourages children to want to keep safe and well.
- -Discusses nurse's relationship to program.
- -Invites campers to come to nurse's office; explain schedule.
- -Stresses need for children to let teachers or nurse know about any minor ailments or symptoms of a health problem.
- -Explains to girls about procedures regarding menstruation at camp.
- -Explains about cabin first aid tray and how the campers may use it.
- -Explains need for increased rest at higher elevation at camp (over 4,000 feet.)
- -Encourages children to wear proper clothing; to wear sweaters and hats when necessary; to keep feet dry; not to wear new jeans on hike; to use lanolin ointment on legs; to check for cracked lips and use ointment.

Selecting bunks and getting settled:

Let the children go outside to get their luggage to provide relief and change from prolonged discussion.

Check summary of special health conditions:

- -See that bed-wetters get bottom bunks near the toilets.
- -Put sleep-walkers on bottom bunks.
- -Locate campers who may need special care nearest to teacher's bunk.

Encourage campers to have a familiar friend on one side of his bunk and a stranger from another school or room on the other side. Point up the opportunity for making new friends. "How do we make new friends?"

After campers put luggage by bunks, give instructions for storing and caring for luggage and demonstrate how to make up bunk bed.

Provide a supply of crayons and tagboard squares so that campers can make name plates for their bunks.

Discussing cabin safety hazards and procedures:

Ask campers to: "Look around, what objects or situations could be unsafe in this cabin?" Make sure students discuss:

-Space heaters (fire). Review procedures for fire drill.

Teacher is the only person to regulate heaters.
Keep clothing away.
Keep bodies and limbs away, especially when undressing.

-Floors (splinters)

Wear shoes or slippers at all times.
Walk -- do not run.

-Beds

Danger of falling off top bunk.
If camper in lower bunk pushes up against bottom of upper bunk he may kick top person off or may force top bunk frame out of hinges so it may drop and land on camper in lower bunk.

-Rafters

Swinging unsafe.

-Showers

Floor slippery.
Regulating showers -- scalding. Let counselor regulate.

Discuss conservation and thrifty use of supplies. These include:

- -Paper cups
- -Paper towels
- -Water running in toilets
- -Water in showers

Collect certain materials for safekeeping, such as:

- -Money -- no place to spend it
- -Unsuitable comic books

Discuss dispostion of chewing gum, cookies or candy that have been brought to camp.

Prepare group for tour of camp.

TOUR OF CAMP

Point of View

The tour of the camp provides a chance for furthur orientation of campers to fellow campers, the camp facilities, and the surrounding countryside.

Overview

As soon as the cabin group orientation has been completed, the children go with the teacher and classroom leaders on a tour of all camp buildings. After campers have become familiar with the function of each facility, they learn the camp boundaries. Their desire to know what is beyond is satisfied with a hike which takes them out of sight of the camp and gives them some idea of the mountain terrain.

One of the planned activities included in the orientation hike is the crossing of the monkey bridge or some similar experience in which the excitement and fun of the activity breaks the ice and allows campers to get acquainted in a spirit of fun.

Expected Outcomes

The child learns the location, function, and rules covering use of the:

- Office
- Postal letter drop
- Camp infirmary
- Meeting areas
- Flagpole
- Quarters of other campers
- Weather station
- Museums
- Craft shops
- Camp boundaries

The child:

Gains a clear idea of many of the activities offered in the outdoor education program.

Is encouraged to think about the selection of an activity for the following day.

Gets acquainted with his cabinmates under favorable conditions.

Releases some of his energy through hiking.

Materials

Cabin list
Health summary
Pencil
First aid kit

Procedures

Check health summary to learn if any children should be restricted from even this first short hike.

Check for proper clothing and shoes.

Learn where other cabin groups are and start the tour of camp so as to not cause congestion in any of the buildings.

Move informally from one place to another so that a good audience situation results.

Explain briefly:

- How each facility is used in the camp program.
- How each child can use the facility.

Stimulate the campers' interest in making use of the facilities. Encourage them to make a choice of craft activities so that they can sign up for the activity later.

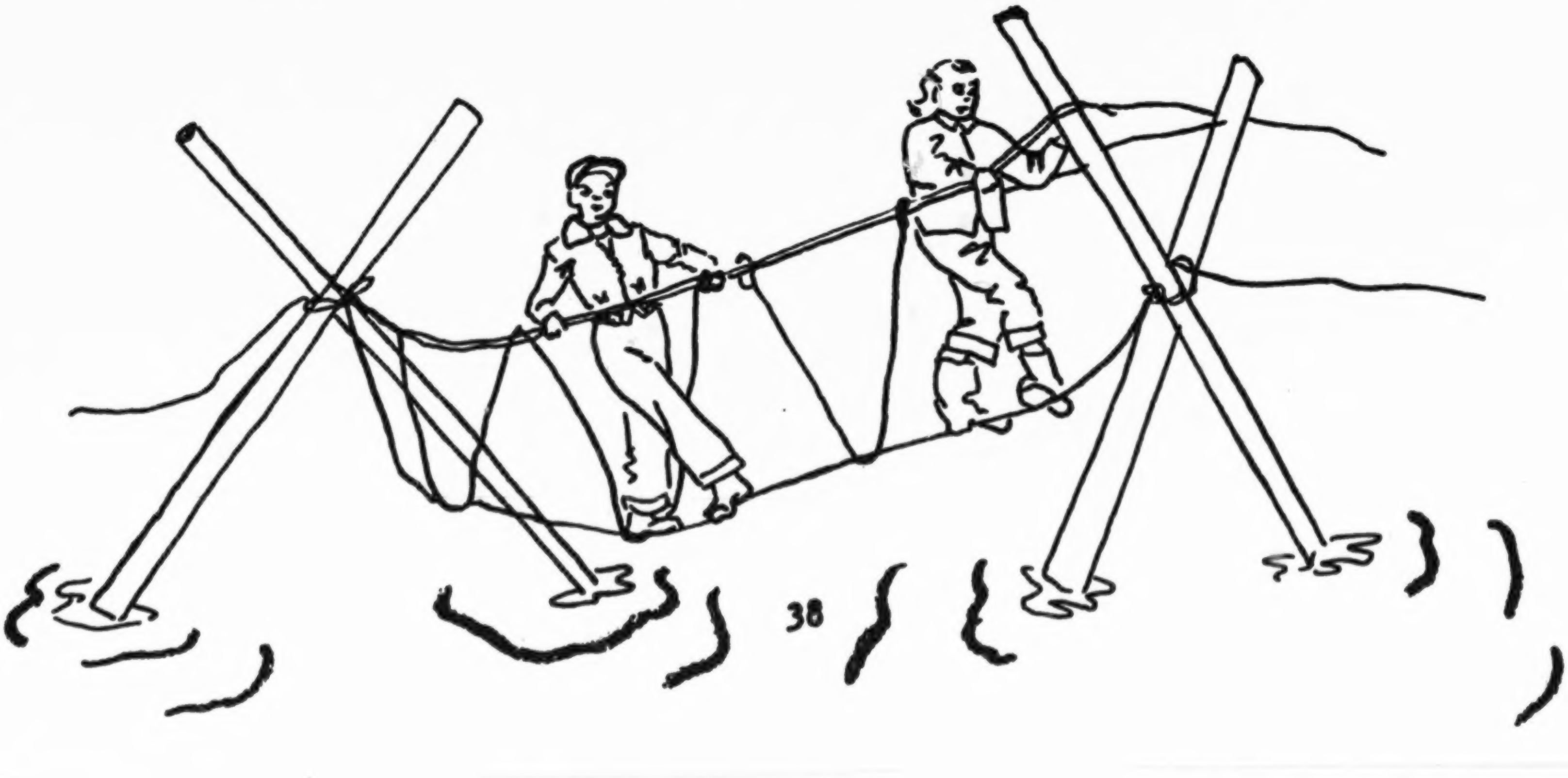
Explain reasons for establishing camp boundaries and explain when they are in effect.

Hike to the monkey bridge. Time your approach to avoid congestion.

Be sensitive to individual differences among children. Anticipate to guard against the following situations:

- A poorly coordinated camper who is not ready for such a test as crossing the bridge. Failing in such circumstances may be embarrassing. Prepare for such an eventuality in a brief talk before crossing.

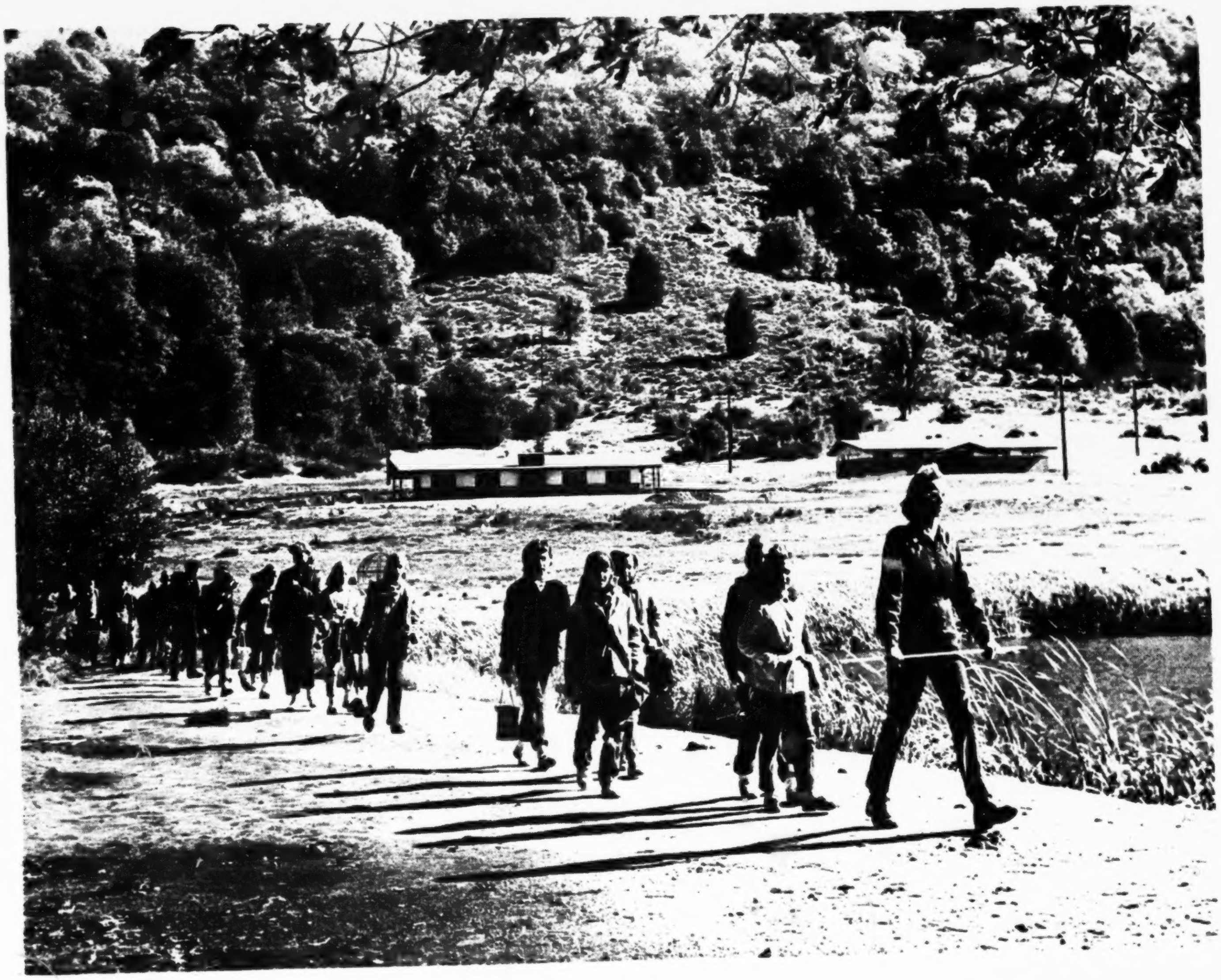
- A show-off who deliberately falls off bridge.



Hike away from camp so that children get their first feeling of being out in the wilds.

- -Review basic rules of safety on the trail.
- -Allow the group to move informally but behind the counselor.
- -During snake season hike in single file.

Pace the hike so that the return to camp is on schedule.



CHAPTER VI

KEEPING SAFE AND WELL

The first responsibility of the camp staff for the children is to keep them safe and well.

POTENTIAL HAZARDS OF UNFAMILIAR EXPERIENCES

It is important that a carefully planned program of health and safety be developed for boys and girls in camp because the environment, activities, and potential hazards are new in their experience. The very goal of providing new experiences leads to increased hazard.

The recognition that new experiences are potentially dangerous has been one of the factors contributing greatly to the excellent record for health and safety in the school camps.

Every experience in the outdoor education program has been thoroughly studied to determine hazard.

Health precautions and safety orientation is included in the orientation of every activity. Good health and safe conduct become more than goals; they become a way of living in camp and outdoors.

Recognition of the high regard held by the U.S. Forest Service for the camp safety program is shown in the following excerpts from a letter from a U.S. Forest Service District Ranger:

> "To my way of thinking the camp people at . . . . . . are doing a magnicicent job. They realize that doing the job safely is the first consideration. They have impressed this on their students so that they, too, feel that safety is an important thing and not a sort of half joke. Other factors that contribute to their record are the facts that they will not permit any boy or girl to work in the woods that is not 100% on the ball safety-wise.
>
> "Another factor, undoubtedly, is the 12-year-olds' recognition that they do not know everything and their willingness to learn.
>
> "If we will let them, I am sure these sixth graders can teach us a lot about working in the woods and getting the job done safely."
>
> Raymond M. Rice

TIMELY INSTRUCTION IN HEALTH AND SAFETY

The outdoor education program is well suited for instruction in health and safety because the students sense the cause and effect of reality in the living situation. There is little room for "fudging" in safety through procrastination and rationalization. The facts are clearly seen by the campers.

- Over-exposure to the elements results in illness.
- Unsafe conduct results in injury.
- There can be no place at camp for boys and girls who jeopardize not only their own well-being but that of their fellow students.
- A sick child is taken home for treatment.
- An injured child is taken home for treatment.
- A child who demonstrates that he is hazardous either by attitude or behavior is restricted to whatever degree is necessary in order to protect himself and his fellows.

RESPONSIBILITY FOR THE HEALTH AND SAFETY PROGRAM

The health and safety program is an essential part of every activity in camp and out in the field. In a program where students are engaged in activities spread out over many square miles, the health and safety program must be decentralized around each camp teacher as an important unit in the organization. Thus the teacher in charge of an activity becomes the person responsible for the health and safety program for that activity.

The camp nurse, the head counselor and the camp principal are directly responsible for the overall health and safety program at camp. Together they plan a team approach in which every teacher understands his responsibilities and develops the skills necessary for him to fulfill his function in the health and safety program.

Responsibilities of the Camp Nurse

The camp nurse:

- Works with the camp principal and head counselor in developing a camp health program guided and advised by the camp health board through "Standing Orders for First Aid in Camps Located Within San Diego County." (See appendix.)
- Helps to coordinate the health program.
- Works cooperatively with the staff in developing a team approach to health and safety.
- Provides leadership to counselors in inservice health education.
- Assists in environmental control (safety).
- Renders first aid.
- Promotes good sanitation in all aspects of the camp program.
- Provides adequate nursing care.

- Recognizes symptoms of disease.
- Provides necessary isolation for sick students.
- Carries out referral measures to parents, doctor, and the San Diego City-County Camp Commission regarding injury or illness.
- Maintains medical records and insurance forms.
- Cooperates with the Health Education Departments of participating school districts.

PLANNING FOR EMERGENCIES

Accidents

PREVENTION OF ACCIDENTS

The best approach to handling emergency situations is to prevent them from happening. A little extra time, thought and effort spent in planning about safety procedures can pay dividends in preventing accidents or other kinds of emergencies.

No activity in the outdoor education program should ever be undertaken until a thorough orientation on accident prevention and safety procedures has been presented in realistic detail. Suggestions for such orientations are included in each activity description.

PREPARATION FOR ACCIDENTS

A good plan for handling emergency situations is to be prepared for any accidents that have not been successfully prevented. To this end, all camp teachers will receive specific training in providing first aid for those injuries and accidents that might be anticipated in an active outdoor program.

Included in preparation plans are the following items of equipment and procedures of action:

Equipment

- First aid kits (one per counselor).
- Map and compass.
- Stretcher and field kit at infirmary.

General Safeguards

- Have two adults supervising away from camp activities.
- Hike only in approved areas.
- Record in advance the hiking route to be followed.
- Practice safety precautions listed for the activity.
- Keep a vehicle available when activity groups are far from camp.
- Store life ring near ponds.

-Follow all safety procedures in driving. Use tire chains, drive slowly, etc.
-Carry out plans for caring for emergencies in the field.

CARE OF INJURIES

Because of the great variety in circumstances to be found in different emergency situations, guidance can best be expressed in terms of principles rather than by specific formulas. The following principles are suggested as guides to help teachers who are confronted with the responsibility of handling an emergency situation:

-Take care of first things first.

What is the immediate need?
Keep free of unnecessary "busy" work.

-Take the initiative. Someone must take charge of the situation.

-Give the outware appearance of calm competence.

-Delegate responsibility.

Select dependable children as leaders to supervise remainder of camp group.
Use helpers where they can be most effective.
Classroom teachers who are strong in first aid but not able to hike in rough, unfamiliar country might stay with the group while the camp teacher returns to camp.

-Prevent the emergency from causing other emergencies.

Guard against panic.
Except for the speedy treatment of injuries requiring fast action, don't hurry; force yourself to be deliberate. Think carefully before acting.

-Establish communication with camp staff in some manner.

-Work for good morale and care of children until help arrives.

There are relatively few instances when injuries in the field demand great speed in action. The following are among the more common injuries and conditions that do require speed:

-Stoppage of breathing
This condition, whatever its cause, (drowning, electrical shock, heart failure or injury) demands the most immediate action.
Apply mouth-to-mouth respiration technique.

-Excessive bleeding

Stop the bleeding in some approved manner. Use direct manual pressure if necessary. Do not use tourniquet except in very special cases.

-Shock

A certain amount of shock is present in many injuries. When shock is deep or when it occurs in conjunction with certain other conditions it can be very serious. The essentials of treatment for shock are to place victim in prone position and keep him warm.

-Heart failure

Treat as for shock except that some conditions require a sitting up position for comfort in breathing. Give artificial respiration if nesessary.

-Snake bite

The danger of a rattlesnake bite is somewhat alarming because of the dramatic action associated with it. Actually, no child has ever been struck by a rattlesnake in the history of the outdoor education program. However, the danger is always near and it is proper to be prepared. The first aid treatment involves:

1. Treatment for shock. Avoid exertion.
2. Blocking off the poison from reaching the heart--constricting band.
3. Removing the poison by suction.

Subsequent treatment may include the use of antivenom serum administered by the doctor.

In all cases demanding great speed in treatment, the teachers in charge will, of necessity, call upon their own resources of training, experience, and personal fortitude to cope with the immediate situation.

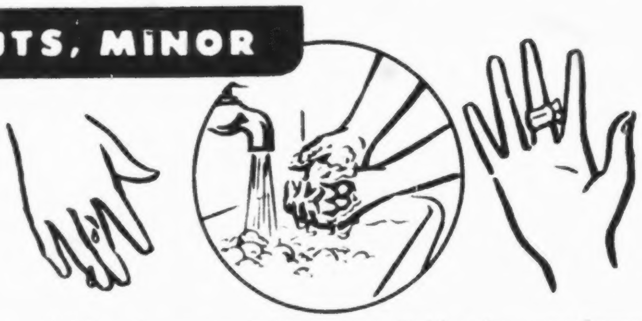
In addition to meeting the problem of administering immediate first aid, the teachers in charge are faced with the problem of informing the camp staff and requesting further aid in treatment and transportation.

Some of the factors that should be considered in the emergency are:

-Proper treatment of victim.
-Adequate supervision of members of group to keep them calm and safe.
-Problems of selecting messengers to inform camp staff and request aid. (Are the messengers likely to get lost or injured?)
-Is the second adult a classroom teacher who is not familiar with the terrain or who may be physically unable to move easily through rough terrain?
-Should the classroom teacher stay with the injured child while the camp teacher returns to camp for help?
-Are there any dependable children who are familiar with the terrain?
-Careful designation on topographic map showing the location of injured camper.
-Written message describing the extent and nature of injury.

First Aid

CUTS, MINOR



Wash with soap and clean water. Hold under water faucet. Apply sterile gauze dressing.

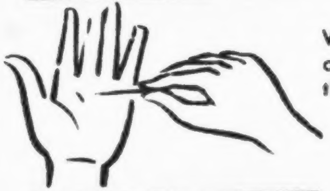
NOSE BLEED

Apply cold or wet compress over bridge of nose. Sit with head tilted forward and press bleeding nostril firmly against middle partition for at least five minutes. Do not blow nose. See physician if bleeding does not stop.

DROWNING

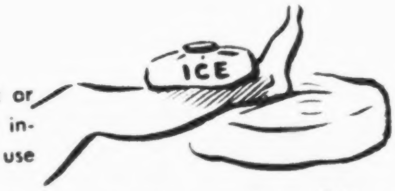
Give artificial respiration. Treat for shock. Call for medical help.

SLIVERS



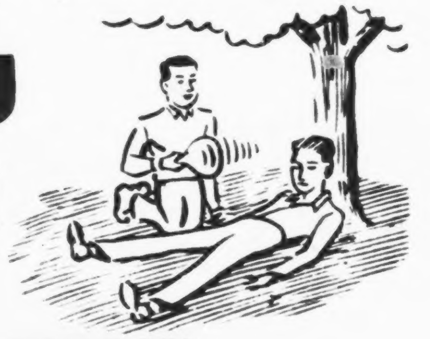
Wash with soap and water, then "tease" out with sterilized needle point (pass through flame). Wash again.

SPRAINS



Elevate injured part. Apply ice pack or cold cloths for 25 minutes right after injury. If swelling is unusual do not use injured part until seen by physician.

SUNSTROKE

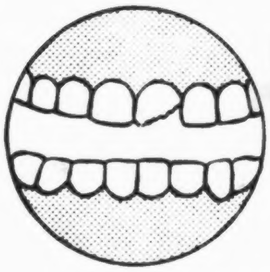


Symptoms — Body hot, face dry. Person irritable. Lie down with head elevated. Loosen clothing. Keep in shade. Fan. Call physician immediately.

UNCONSCIOUSNESS

Never give anything by mouth. Lie down with head turned slightly to one side. Loosen clothing. Call physician, unless you are sure it is a simple fainting spell.

DENTAL INJURIES



CHIPPED OR FRACTURED TOOTH —Avoid sharp changes in temperature (ice water, hot drinks, etc.) and see dentist immediately.

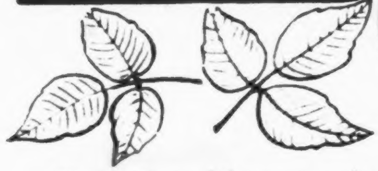
SWELLING OF THE FACE due to an abcessed tooth — Apply ice bag only and consult dentist.

EXCESSIVE BLEEDING OF TOOTH SOCKET following extraction. Place sterile gauze pack over socket and hold in place under pressure by biting and see dentist at once.

POISONING

Call physician at once. Drink 2 heaping teaspoons of powdered mustard in glass of milk OR 1 pint to 1 quart of soap suds. Follow with more water and cause to vomit. For mercury poisoning, drink white of egg or 1 glass of milk. Artificial respiration if needed.

POISON IVY



Wash with naphtha soap and water 5 or 6 times. Do not use scrub brush or rough material. If area is large and spreading, call physician.

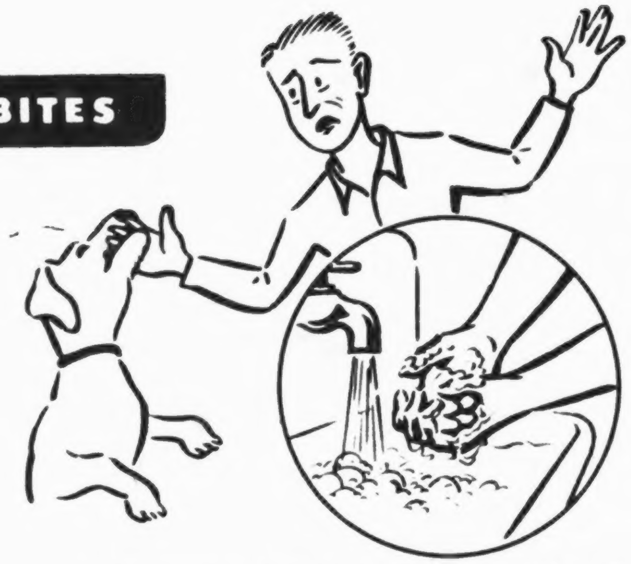
PUNCTURE WOUNDS

If puncture is deeper than skin surface, always go to physician. Apply pressure bandage in meantime.

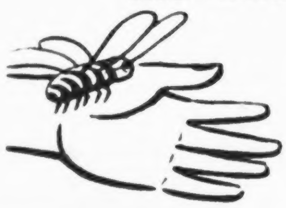
SCRAPES

Use wet gauze or cotton to sponge off gently with clean water and soap. If scrape is deep and dirty, consult physician.

BITES

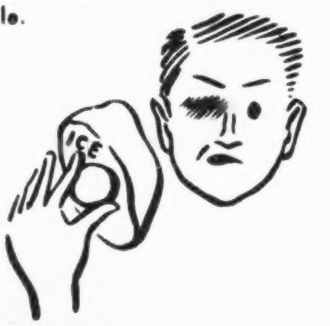


Wash wound with soap and clean water. Hold under running water for 5 minutes. Apply sterile dressing and see doctor immediately.



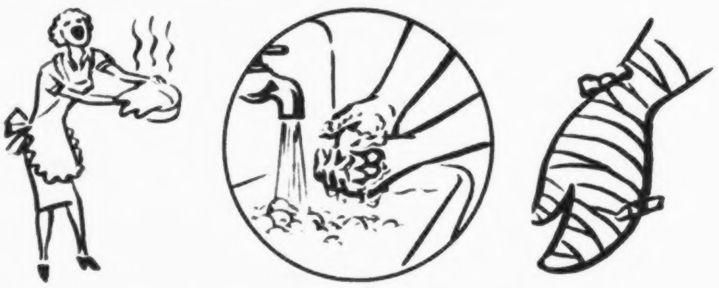
Remove stinger if present. Apply ice bag or cold cloths if swelling is large. Apply Aromatic Spirits of Ammonia if available.

BRUISES



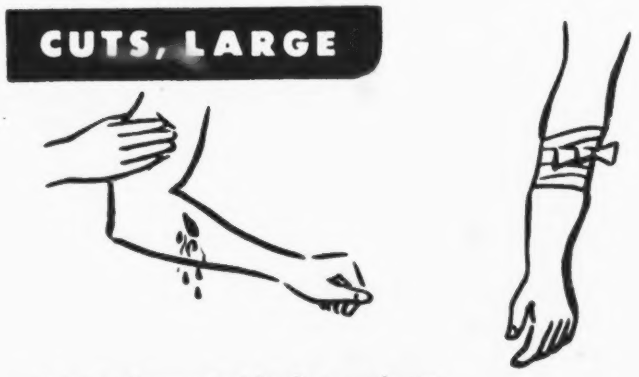
Apply ice bag or cold cloth for 25 minutes. If skin is broken, treat same as cut.

BURNS AND SCALDS



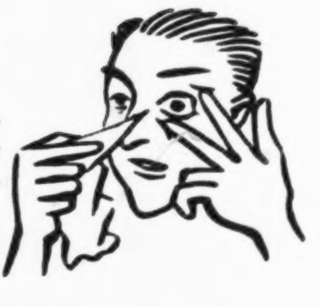
DO NOT APPLY PETROLEUM JELLY OR GREASE OF ANY KIND. Wash with soap and water. Cover with sterile fine mesh gauze (bed sheeting) held against burn with pressure. Consult physician.

CUTS, LARGE

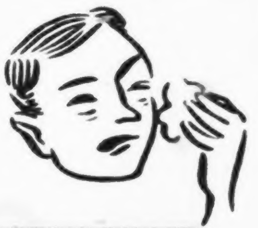


In cases of excessive bleeding, apply pressure until bleeding stops. See physician.

EYES

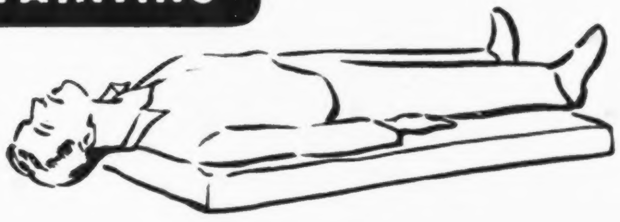


Remove foreign bodies by gently touching with point of clean handkerchief or washing with Boric Acid. Never rub eye. If unsuccessful, go to physician.



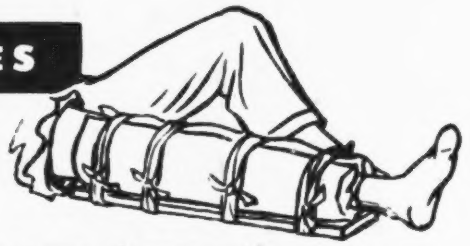
If chemicals splatter into eyes, wash with plain water and go to physician immediately.

FAINTING



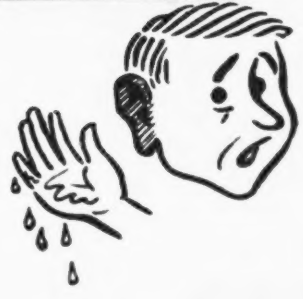
Keep in lying position with head down. Loosen clothing around neck immediately. Sprinkle face lightly with cold water. If person does not respond in short time, summon physician and keep person warm with blankets.

FRACTURES



Any deformity of injured part usually means a fracture. Do not move person if fracture of leg or back is suspected. Summon doctor at once. If person must be moved, immobilize with temporary splint as shown.

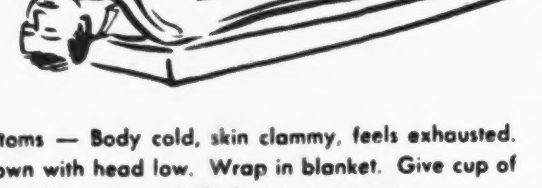
FROSTBITE



Symptoms — Pain and grayish-white color in frozen part. Gently cover with hand or place in water at room temperature to thaw out gradually.

DO NOT RUB. DO NOT EXPOSE TO FIRE OR HOT WATER.

HEAT EXHAUSTION



Symptoms — Body cold, skin clammy, feels exhausted. Lie down with head low. Wrap in blanket. Give cup of strong coffee or tea. Call physician at once.

Illness

CARE FOR CHILDREN WHO BECOME ILL

The camp infirmary is designed to care for emergency first aid and temporary ailments. It is not designed as a holding hospital. As soon as it becomes clear that a child is going to continue to be ill or incapacitated for more than 24 hours, efforts will be made to move the child from camp to his home or to a hospital for follow-up treatment.

The responsibility for determining whether or not it is advisable for a child to be returned to his home is shared jointly by the camp nurse, the camp principal, the head counselor, and the child's parents. The opinion and advise of the classroom teacher is invited and considered in making the decision.

If it is decided that a child is in need of medical care, the following steps will be taken:

1. The camp nurse will phone the parents to inform them of the situation and to get their recommendations and decisions for subsequent action. The camp nurse may suggest certain courses of action to the parents.

    - If the illness or injury appears to be minor, it may be possible that a doctor in one of the nearby communities can take care of the matter so that the child can return immediately to the camp program.

    - If the child is too ill or injured to remain at camp, the camp nurse will check to make sure that someone will be available at home, or at a relative's or friend's home, to receive the child.

2. If the parents cannot be reached at home, the alternate emergency number will be phoned.

3. If it is impossible to reach the parents or other designated responsible person, the school principal and school nurse will be contacted for advice.

4. In some instances it may be advisable to transport the child to the school for temporary care until the parents can be contacted.

5. If the illness or injury is serious, the child will be taken to the hospital designated by the parent on the registration form.

6. Whenever possible, parents are encouraged to transport the child home. In hardship cases the camp staff will try to provide the necessary transportation.

7. In cases where the child is transported home by his parents, one-half of the bus charge should be returned to those parents. No refunds should be expected from the bus company.

8. Insurance claims will be prepared at camp and sent to the parents for use in case any medical expenses are incurred.

9. The school principal will be notified when any of his children are sent home from camp.

10. In cases where it may be necessary to evacuate large numbers of children from camp, the procedure outlined for emergency evacuation from camp will be followed.

Practices and Procedures for the Health Care of Children of the Christian Science Religion

ENTRANCE INTO CAMP PROGRAM

All children coming into the outdoor education program are required to have a brief inspection and have their temperature taken. No physical examinations are required of children of Christian Science faith.

If the temperature reading of the Christian Science child is found to be too high, the child will be excluded temporarily and a second reading will be taken later in the day. If the second reading is normal, the child may remain at camp. If the second reading is still too high, his parents will be notified and the child will be excluded from camp.

ILLNESS DURING THE WEEK

After the initial entrance temperature readings, the Christian Science child will not be required to have subsequent temperature readings.

If symptoms of illness are noted by the camp nurse the child will be excluded from the program and the parents notified to come to camp and take him home.

EMERGENCY NEED FOR FIRST AID

In cases of need for emergency treatment where neither the family nor a Christian Science practitioner is available at the time and place of emergency, customary first aid care should be given to the child in the best manner possible.

Emergencies would involve an immediate threat to survival (excessive bleeding, broken bones, snake bites, poisons, burns, unconsciousness).

Emergencies would not include the threat of infection.

In general, wounds should be cleansed and covered without the use of antiseptic agents.

It is the responsibility of the child to declare that he is of the Christian Science faith. It is the responsibility of the camp staff to observe the limiting procedures involved in his care.

In all cases of suspected illness or injury the camp staff will notify the child's parents or guardian about the situation.

Emergency Evacuation of Children from Camp

The following procedure has been established to facilitate the transportation of children from camp to school of origin in case of emergency.

The Camp Principal or Head Counselor:

-Notifies school district office of emergency situation.

-Reports the following information:

Name of camp and person reporting.
Name of schools involved.
Number of pupils to be returned.
Names of pupils and school they attend.
Time pupils will be ready for pick-up.
Disposition of luggage.
Need for nurse from district to accompany pupils.
Need for special equipment; chains.

The School District Office:

-Calls school principals involved to:

Report emergency situation and agree upon action regarding evacuation.

Report names of children to be evacuated.

-Determine type of transportation to be used.

-If using district transportation, arranges with transportation office for station wagons or buses.

-If using contract carrier, calls bus company office to report the following information:

Name of camp to be evacuated.
Number of pupils and name of schools to which they should be returned.
Recommended time for arrival of bus at camp.
Disposition of luggage.
Need for extra nurse to go to camp on the bus.
Need for special equipment; chains.

-Makes arrangements for extra nurse to ride up on bus to provide added care.

-Calls camp and reports arrangements made.

-Indicates the approximate time buses will arrive at camp.

The School Principal:

-Calls parents of returning children and advises them of situation. Advises them of plans, and time and place for pickup of children.

-Coordinates pickup of children and luggage by parents.

The Camp Principal or Head Counselor:

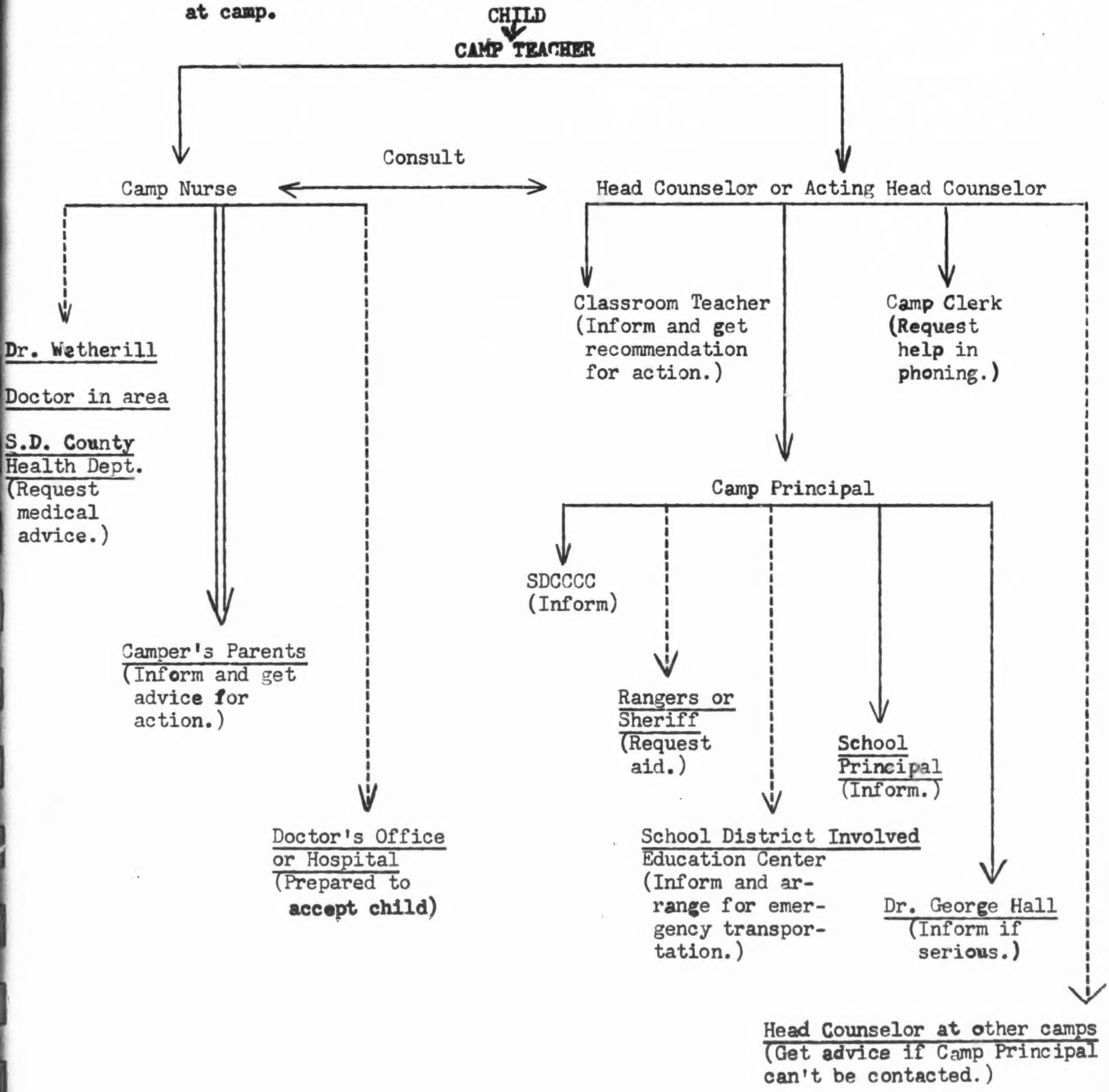
-Sees that all necessary calls are made as per designated lines of communication.

-Calls the district office to report that buses are departing from camp and gives final estimate of arrival time at school.

Lines of Communication in Emergencies

Fortunately, most emergencies allow enough time to communicate with the persons who can provide counsel for treatment and action.

The need for good communication is imperative. The chart below outlines the usual contacts to be made by telephone calls. This chart, together with all of the necessary phone numbers, will be posted near all phones at camp.


CHILD
CAMP TEACHER
Consult
Camp Nurse
Head Counselor or Acting Head Counselor
Dr. Wetherill
Doctor in area
S.D. County Health Dept. (Request medical advice.)
Camper's Parents (Inform and get advice for action.)
Doctor's Office or Hospital (Prepared to accept child)
Classroom Teacher (Inform and get recommendation for action.)
Camp Clerk (Request help in phoning.)
Camp Principal
SDCCCC (Inform)
Rangers or Sheriff (Request aid.)
School Principal (Inform.)
School District Involved Education Center (Inform and arrange for emergency transportation.)
Dr. George Hall (Inform if serious.)
Head Counselor at other camps (Get advice if Camp Principal can't be contacted.)

Special Emergency Situations

GETTING LOST IN THE OUTDOORS

How to keep from getting lost:

-If you are with a group, stay with the group. If you find it necessary to leave, let someone know where you plan to go and when you plan to return.

-Carry a compass and map of the area with you. Learn how to read the compass and how to orient the map to your surroundings. Learn how to use your watch as a compass.

-Pay attention to landmarks such as streams, ridges and peaks. Keep them located in your mind.

What to do in case you get lost:

-The greatest danger in getting lost is panic. Sit down, rest, think and stay calm. REMEMBER ---- You will be found. Searching parties will look for you until you are found.

-Stay near those places where searchers are likely to look for you.

Along a trail or road.
Near the place where you said you were going.
Out in the open where visibility is good.

-Don't try to take shortcuts.

Through thick chaparral (you will exhaust yourself).
Over or along steep cliffs or high rocks (you may slip and injure yourself).

-If the surrounding country is wild and rough - -

Do not try to hike in the dark.
Pick an open spot and establish a marker that can be seen from the air. Prepare a shelter nearby against the weather; shade in the summer and protection from the cold and wind in winter. Dig a hole and line it with dry leaves and cover yourself with more dry leaves and dirt.
Try to locate water nearby.

-If the fire hazard is high, do not build a fire - You may be committing suicide.

-If the fire hazard is not high, prepare a clearing and build a small fire. Add to it until smoke can be seen. Green wood and brush will provide more smoke.

At night build a blaze than can be seen as a signal.
BE SURE TO EXTINGUISH ANY FIRES THAT ARE BUILT !

-If the surrounding countryside is easy to hike through - -

Go up on a hill to check bearings. Orient yourself with landmarks as you hike downhill until you reach a road, then stay on the road.

Remember night time is a friendly time. There are no wild animals in the area that will attack humans.

Guard against aimless hiking in huge circles.

-A series of three whistles, three shouts, three shots or three flashes are signals of distress. Use them for distress signals only!

How to find directions by your watch:

-Hold your watch level and point the hour hand to the point on the horizon directly below the sun.

-Halfway between the hour hand and the numeral 12 will be south.

FIRE PROTECTION

Fire prevention:

Fire prevention is an important aspect of any camping activity in the Southern California mountains. In the school camp program, special consideration is given to fire preventiom in the following situations:

-The camp buildings.
-Cookouts
-Burning of slash in conservation projects.
-Smoking practices of adults.

The camp buildings:

The camp teacher's first responsibility in case of fire is the safety of the children. Make sure the campers understand about fire drills and the fire siren.

When a fire is detected by a teacher, it is his responsibility to notify others, if necessary. If he cannot handle the fire completely by himself he must immediately see that others on the camp staff are notified, or a general alarm sounded.

The fire signal is the siren; or, in event that the siren is out of order, a series of strong blows on the gong in quick succession.

8

When the siren is sounded, the teachers shall move their groups quietly and in good order out from the buildings to a general meeting place where a checkup will be made of the children.

The teacher must familiarize himself with the location of water stand pipes, base storage, light switches, and gas and oil valves.

Cookouts:

Cookouts will be permitted only when the weather is favorable. They will be cancelled if there is a high fire hazard.

Cookout areas should be cleared of all brush for a distance of thirty feet in all directions.

Firewood, duff and slash shall be cleared for fifteen feet from the fire.

Water containers (stirrup pumps or #10 cans) shall be filled with water and placed ready for use.

Putting out the fire should provide a real teaching opportunity. The ashes should be watered down and covered only with mineral soil free from leaves and twigs.

Burning of slash in conservation projects:

All burning of slash in conservation work projects is done only under the direct supervision of a U.S. Forest Service representative. He will outline the specific regulations for burning, including:

-Fire permit for burning.
-Supervision.
-Clearance to burn on any particular day.
-Methods of burning.
-Safeguards against spread of fire.

Smoking at camp:

Smoking at camp is restricted to those specific buildings designated.

Smoking in bed is illegal, and strict enforcement of this law at camp is imperative.

Smoking is prohibited in the presence of children. Care should be given to the disposal of cigarette butts. Cast off cigarettes are a temptation to some children.

Fire suppression:

The first objective is to put out the fire. If this is impossible, the second objective is to prevent the fire from spreading to other buildings and areas. Clear thinking and speed in the first few minutes may prevent a conflagration.

The most effective method of suppression is by smothering the fire with dirt, baking soda, CO_2, or fog (a very fine spray). CO_2 fire extinguishers are placed ready for use throughout the camp. Baking soda extinguishers and soda-acid extinguishers are stationed ready for use.

The soda-acid type of fire extinguisher may be sprayed effectively with a finger on the nozzle. A direct stream wastes liquid and scatters an oil fire. These are reserved for adult use.

Dirt thrown hard with the hands or shovel is effective.

The fire hose in the containers should be carried and joined together if necessary. The supply of water is limited and too many hoses running water reduces the pressure. The 3/4" garden hoses are generally easier and quicker to handle than 1½" hoses.

Further precautions to observe are:

- -Turn off the main light switch.
- -Turn off the inside and outside valves on the fuel oil line.
- -Turn off valves on propane gas lines.
- -Phone the Forest Service (National and State) if necessary. Call the operator and ask for the Descanso Fire Station. Also inform State Park officials.

Fire suppression training will be included in the inservice education program.

Safety procedures during fires:

Fire safety procedures are based upon an understanding of fire behavior. The following are some pertinent understandings about fire:

- -Fires can become explosive when moisture content in the air and in the ground cover (fuel) is low.

- -Fires can travel with great speed when blown by the wind.

- -The arrangement of fuel affects the speed and intensity of fire.

    - . Grass fires will flash but will not have lasting heat.
    - . Fires in scattered trees with little ground cover tend to move more slowly.
    - . A mixture of grass, brush and trees provides an arrangement that generates great heat ahd speed. Enough undergrowth can support "crown" fires.
    - . Fire travels more rapidly uphill than downhill.
    - . Hot air rises. Hot air flowing up a hillside can preheat the

fuel until it becomes explosive.

- Fires generate poisonous gases as well as destructive heat and smoke.

The following safety procedures are suggested as guides for action during forest or brush fires:

-If the fire is small enough to be easily controlled, try to suppress it.

-If the fire is a lightning fire high in a tree, report it immediately.

-If the fire is moving with the wind, get out of its path. NEVER TRY TO OUTRUN A FIRE IF IT IS POSSIBLE TO SIDESTEP IT.

-Try to maneuver to windward of the fire.

-If a fire is in the vicinity, STAY OUT OF CANYONS THAT CAN BECOME TRAPS.

-Avoid situations where it might become necessary to try to outrun a fire by going uphill. A person moves slowly uphill while fire travels swiftly uphill. Heat and smoke also travel faster than a person can climb.

-Do not rely upon barren or cleared areas above a fire for protection. The fire might not reach you but the smoke and heat can sear and suffocate.

-STAY OUT OF DENSE CHAPARRAL. Movement is difficult in brush and you may become trapped. Brush provides a type of fuel in which fire can move swiftly and with great heat.

-Try to find natural barriers such as rock outcroppings or mounds to act as protective screens. Keep the barrier between yourself and the fire.

-If the fire is burning nearby or sweeping overhead, find a cave, a trench, or a depression. Since heat rises, it will be cooler in the low spots. It may be possible to erect barriers or dig trenches if you are trapped.

-PROTECT YOUR LUNGS. Most fire deaths are caused by inhalation of smoke and heat into the lungs. Filter the smoke by covering mouth and nostrils with handkerchiefs or other cloths. Cool the air you breathe by dampening the cloth you breathe through.

-If you are faced with an oncoming fire front you are also faced with the need for making a decision. The natural tendency is to run from fire. It may be possible and wise to do this. However, it may be wiser to survey the area in front of the oncoming fire and select a spot where you will CROSS OVER INTO THE BURN at the right moment. If the vegetation is sparse, you may get hot feet and superficial burns but this may be the lesser of the evils.

-If a group is confronted by fire, someone must take charge with a firm hand. A sense of organization with responsible leadership tends to minimize panic. TRY TO AVOID PANIC.

SAFETY FROM LIGHTNING

During a severe electrical storm remain inside of a building, if possible, near the center of a room. If there is a choice of shelter choose:

- Large metal or metal-frame buildings.
- Dwellings or other buildings protected by independently grounded lightning rods.
- Large unprotected buildings.
- Small unprotected buildings.

Avoid the immediate vicinity of electric light circuits, lightning conductors and downspouts, screened doors and windows especially if open, stoves and fireplaces, telephones, and any metal object projecting through wall or roof.

If unavoidably out of doors, keep away from isolated trees, wire fences, hilltops and wide open spaces, small sheds and shelters in an exposed location.

Try to reach thick timber, a cave, a depression in the ground, a deep valley or canyon, or the vicinity of a steep cliff, if any of these is nearby.

PRACTICING GOOD HEALTH HABITS

A highly motivated living situation provides an excellent opportunity to promote the purposeful practice of good health habits.

Eating Nourishing Meals

The most popular activity at camp is eating. It is also one of the most valuable of all the activities. Mealtime is recognized as a very important teaching opportunity and is treated as such.

The eating of three balanced meals at regularly scheduled times in an atmosphere that is friendly and free from the pressures of issues comes as an experience that is quite new and very important to some of the children.

The most important ingredient in the meals at camp is a relaxed and friendly tone. Good fellowship and sincere consideration for each other are far more important than the mere learning of manners.

A dash of good humor is an excellent tonic and appetizer. Coupled with the example and competition of a table full of hungry campers humor will go further toward overcoming finicky appetites than any attempts or urging or forcing of foods.

THE DINING ROOM

Most of the meals at camp are eaten in the camp dining room. Some notable exceptions are the cookouts and lunches in the field.

Each table of children is counseled by a camp teacher or classroom teacher. The meals are served family style and the children set the tables and do the dishes.

The camp nurse, chef, camp principal and head counselor cooperate in carrying out health and sanitation procedures approved by the Health Department.

Dining room procedures:

Dining room procedures vary in certain details among the camps because of differences in facilities and also because of experimental approaches that are initiated from time to time. Basic goals and practices, however, will be consistent for all of the camps.

Before the meal - -

Selected children will help in serving the tables with such items as milk, butter and bread before the main group of children enters the dining room.

It is important that the teachers be in the dining room and at their tables promptly in order to help the incoming children find places without noise and confusion.

Arrangement of children at tables - -

Some objectives that should be considered in establishing procedures for arranging children together at the dining tables are:

-Mealtime should be:

- An opportunity when campers can meet with their friends from other cabins.
- A good time to promote desirable boy and girl relationships.
- An opportunity to make new friends.
- A relaxing enjoyable experience.

- A chance for all campers to share equally in the chores of doing dishes, sweeping, etc.

- Tendencies to over-organize and regiment the dining room in the interest of efficiency, order and equal distribution of work responsibilities should be resisted.

- Good teashing and alert supervision are the best means of achieving a friendly, relaxed atmosphere in a dining room that is reasonably quiet.

Unfortunately, the greater freedom children have in visiting friends in an informal situation, the noisier the dining room tends to become. Experience and experimentation have shown that acceptable comprises between the goals of informality and quiet can be achieved.

In general, children may select the tables at which they wish to sit and some of the friends they wish to sit with. However, each table may be composed of both boys and girls, alternating with a girl between each of the boys. This arrangement allows for visiting with friends but tends to break up cliques and sets the stage for teaching desirable manners and attitudes.

On Monday the seating pattern for the noon meal will remain the same for the supper meal so that proper and complete orientation about meal procedures can be presented.

The table counselor should sit near the center of the table in order to have a centralized strategic location.

Saying grace - -

Before the children are seated, they may wish to join in singing the camp graces.

Immediately following grace, the teacher will give the necessary orientation for the meal procedures.

Setting a good example - -

The teacher will influence his table group through example. His attitude toward the meal will rub off on the children. His enthusiasm for trying foods will encourage children to try new foods. His courteous manner will not only provide incentive for courteous behavior, it will also act as a guide as to what is courteous conduct.

Teaching good manners - -

The teaching of manners should be done in a subtle, unobtrusive way. It is not good manners to make children self-conscious and uneasy because they feel aware of their deficiencies in training.

It should be remembered that it is far more important to develop attitudes in which there is a desire to be considerate of others than it is to have children mimic the motions of good manners because it is the expected thing to do.

It should also be remembered that not all of the children coming to camp will have the same middle-class background training in manners that most teachers have. This calls for understanding in dealing with children whose background experience made it acceptable to reach for what they want while it is still available.

Some of the manners that are taught as natural expressions of consideration and courtesy are:

-Take only small helpings so that there will be enough to go around. Second helpings can be had later after all have been served.

-Use the words "please" and "thank you" to show appreciation. These words help to establish a nice tone for the meal.

-Sample a little of each kind of food. The cooks have worked hard to prepare appetizing food and it is only fair to give their food a fair try.

-Wait until all are served before starting to eat so no one will feel left out.

-Try to keep the table conversation generally interesting, quiet, and in good taste.

-Do not reach in front of others for food.

-Eat at a leisurely pace. Don't rush, grab or gorge.

The table counselor as host should see that any necessary introductions are made.

Serving food - -

A "table hopper" will be selected by each counselor to go to the serving counter and get the dishes of food for the table. Only one child should be away from each table at a time.

The "table hopper" should be directed to carry only one dish of food at a time. He should be cautioned to be careful and to walk slowly in the dining room.

In order to give children experience in serving themselves properly, the main dishes are passed family style around the table. Desserts and foods that are difficult to serve should be served by the teacher.

Children are encouraged to take a small helping of each of the foods passes to them. They are urged to sample the foods they say they do not like. When such urging is done with humor, children will in most cases at least try the food. Children should not be forced or pressured into eating foods they reject. Mealtime is not a time for issues.

Children wait until all of the others at the table are served or until the teacher indicates that they are ready before they start eating.

In order to prevent many partially-filled milk cartons from returning to the kitchen, one carton of milk is emptied before another is opened. Usually one carton is opened simultaneously at each end of the table in order to minimize the need to pass the cartons around the table.

Ample milk to meet childrens' health requirements is served. It may be necessary to limit the amount of milk to certain children who are washing down their food with milk, drinking it in place of water to slake their thirst, or drinking it as long as it is available.

Special situations - -

Table counselors should take the initiative in giving guidance and counsel to children who may be inclined to gut themselves as a means of gaining attention. They should not hesitate to limit the amount of food in the interests of good digestion, example for others, balance in diet, and common sense.

The teacher should be cautious in insisting that campers eat all or any portion of the meal because the child may:

- -Feel ill.
- -Be allergic to certain foods.
- -Be restricted in diet for religious reasons.

It is wise to check with the camp nurse or head counselor in such cases.

When the meal is finished - -

When the meal is finished, have one child return the unused food to the kitchen. This child need not be the "table hopper" who has probably already been delayed in his meal. It should be someone who is finished and waiting. He should be reminded to BRING BACK

THE EMPTY DISHES TO BE WASHED AT THE TABLE.

All of the dishes should be scraped by the teacher or a designated child and stacked ready for washing before dessert is brought to the table and served.

When the dessert signal is sounded, the "table hopper" will go to the counter and get it.

Garbage is emptied by a child in the can provided. Care should be taken in emptying the garbage so as not to spatter the walls or other children. It may be advisable to explain that some types of leftover food cannot be saved for future meals because of health regulations.

All of the paper and trash is collected and put in the designated place. Before the meal is ended, the teacher should have selected three children to do the dishes. During the first two meals at camp, all of the children will stay at their tables to learn about dishwashing procedures.

The children are excused as a table, not individually, when the meal is finished and everything is ready for washing dishes.

Dishwashing procedures:

Dishwashing procedures may vary in the three camps because of the differences in facilities available.

The following procedures are recommended because they have carry-over value into the home. The school camp has long been recognized by parents has an important factor in raising the sanitation standards for dishwashing in many homes in San Diego County.

The dishwashing activity is supervised by the classroom teachers and the dining room supervisor.

One dishwasher and two driers are secured before the meal is finished - the earlier in the meal, the better.

These three remain after the others are excused, except at the first two meals, when all the children remain for orientation in the procedure used in washing the dishes.

The table counselor gets the three pans of water (one soap water, one rinse water and one disinfectant water) and brings them to the table. He also gets a sponge, a rag, and two drying towels.

The table is first washed by the counselor. The children wash their hands in detergent and then in disinfectant water at a designated table before they begin washing the dishes.

Silver is placed in the pans first to soak while the water is hot and sudsy. Cups are washed first, then silver, then the least soiled to the most soiled dishes until all are washed.

Dishes are washed in the soapy water, rinsed in the clear water, then in the disinfectant water, and dried.

When the dishwashers have finished, they carry the dishpans back to be emptied. Then they wash off the table with the sponge and wipe it dry with one of the drying cloths. The table is then reset as before.

Neither the wiping towels nor the sponges are to be used to wash off or dry the benches. There are paper towels provided for this purpose. Wet towels are laid on a table near the kitchen where they are picked up to be washed and dried.

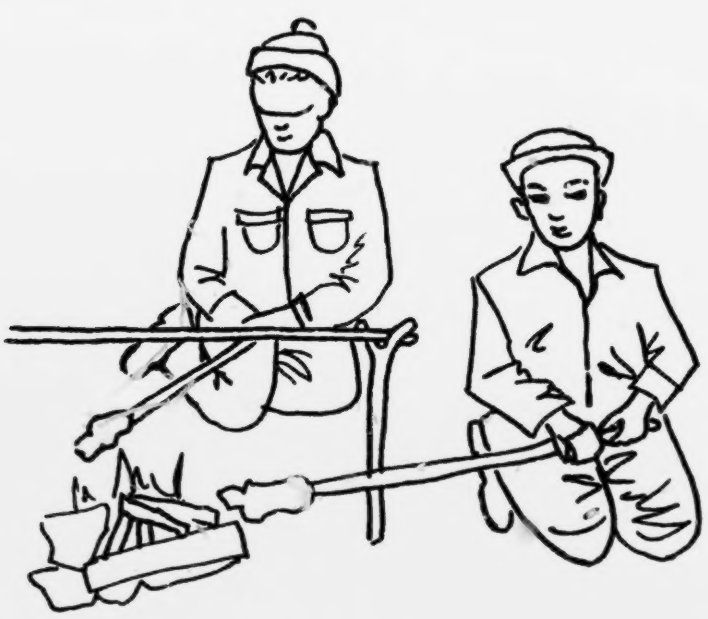
COOKOUTS

The cookout is a good example of an activity in which the learning is motivated by a strong feeling of purpose. In this case, the chief purpose of the camper is to eat. The aim of the teacher is to provide an educational experience. The cookout offers some very real challenges in woodsmanship and campcraft.

-Can the camper build and start a fire?

-Can the camper cook a meal that is edible?

Realization that he will eat the mistakes he makes provides additional motivation for attentive listening.



Campers may cookout in varied situations. Some of the activities involving cookout experiences are:

-The cookout as a half-day activity. This includes much discussion, planning, problem-solving and preparation.

-The cookout as a means of preparing food in the field during a conservation work activity. This is a shorter version of the cookout. It does not involve as much individual planning.

-The cookout where a committee accepts responsibility for preparing the meal for children who are engaged in other work.

Much experimentation in varied styles of cooking is attempted: Hobo stoves; ovens; central fire; on a hot rock.

Through the media of the cookout, the child:

- Enjoys a meal he has prepared for himself.
- Gains a sense of competency and self-confidence through mastering some important skills of woodsmanship and campcraft.
- Appreciates the importance of the modern automatic kitchen.
- Understands the nature of and need for a balanced menu.
- Learns and practices rules and regulations governing fire prevention in state, national and county parks and forests.
- Practices safety.
- Appreciates the problems of sanitation faced by primitive peoples.
- Gains satisfactions in contributing to a worthwhile group effort.
- Learns about edible native plants and prepares some to eat.
- Learns about the state park and how it can best be used.
- Practices good housekeeping in the outdoors.
- Gains enthusiasm for outdoor living and increases interest in future camping and picnicking experiences.

Materials used on cookouts include:

- Canteens.
- #10 cans for carrying food, cooking containers, stoves, water buckets.
- Containers for carrying food.
- Shovels.
- Saws and axes if large wood is to be used.
- Pocket knives (campers furnish).
- Paring knives.
- Silverware, serving spoons, forks.
- Can opener (use scout knife if available).
- Paper cups.
- Paper plates.
- Waxed paper for food sanitation and protection.
- Matches.
- First aid kit.

Cookout procedures:

Planning the menu--

Discuss the kinds of food that are needed in a balanced meal. Select foods desired from the list of available foods made up by the kitchen staff.

Many of the food suggestions will need to be evaluated by the group against the criteria they have established for selecting a balanced meal.

Some compromises will be made in the area of individual likes and dislikes for particular foods.

The teacher should reflect upon how much influence he has exerted in the selection of the menu. Do the children feel they have selected the menu?

Budget the cost of the meal (optional). Distribute paper and pencils to either the whole group or a committee for figuring the cost of the food against the money allowed the group for the meal.

- How much can group spend? (about 50¢ per child)
- How much of each item on the menu will the group need? What will it cost?
- What is the total cost of the food included in the menu?
- Is our menu within our price limit?
- If there is a difference, how should the menu be adjusted?

Send the food order to the kitchen by the time designated so that the cooks can prepare the order on schedule.

Dismiss the group for toilet and necessary clothing changes.

Selecting a site for the cookout--

The cookout group meets at a designated spot to pick up food and equipment and start for the cookout area. If the food is not ready, part of the group may come for it later while remaining members gather wood after selecting cookout site.

Be sure to clarify the point that state and county laws prohibit the building of open campfires in the mountains of Southern California except under special conditions. Explain that the building of campfires and cooking fires in the school camp program is one of these exceptions.

Emphasize that under no condition would they plan to build an open campfire in county, state or national parks or forests.

- Stoves are provided in the proper places for such purposes.
- Even burning on private land must be done in strict accordance with rules and regulations.

Discuss the earmarks of a good cookout site.

- In a designated place.
- In a properly cleared area.

Explain when it is permitted to have a cookout.

- Only when clearance has been given by proper authority.
- Only after obtaining fire permits, etc.
- Only when the fire danger is low.

Building the fire--

Discuss what kinds of wood is needed.

- Green for use as cooking utensils.

        - How can we tell when wood is green?
        - How shall our utensils (weiner or bread sticks, broilers and so forth) be made? Demonstrate cutting and trimming of willow and make a sample.

    - Dry for fire wood.

        - How can we tell when wood is dry?
        - What sizes of wood will we need for our fires? Explain and show samples of tinder, kindling and firewood; emphasize the importance of building a large woodpile.

Discuss how to lay a fire.

- Will the wind help or hinder the burning of the fire? What is the importance of oxygen for fire? How do we get a draft?

- What is the nature of fire?

- What kind or kinds of fires are needed for the particular types of cooking which will be done? (Examples: small tepee fire for frying, using hobo stove; pit fire for baking or roasting, using hot coals; shallow pit with coals for reflector oven.)

- What are some methods of laying the tinder and kindling so that the fire will light easily? Demonstrate one or two ways of building a fire and show how to use the match in lighting.

Discuss what safety measures must be observed.

- No fires near brush--thirty feet clearance.
- Water bucket near each fire.
- Woodpile stacked away from fires.
- Proper extinguishing of fires.

Discuss the following, if needed:

- How is a hobo stove used?

    - Demonstration of cleaning stove top.
    - Proper placement of stove in relation to wind.

- How is a reflector oven used?

    - Proper placement in relation to wind.
    - Proper amount of heat.

Assigning jobs--

Discuss which jobs will need to be done.

-Clearing in fire areas.
-Gathering wood.
-Laying fires.
-Filling water buckets.
-Making any necessary utensils.
-Preparing food. Briefly discuss preparing the foods and demonstrate any methods which may be new to the campers, such as how to wrap and bury potatoes or apples for baking; how to cut an orange so that the shell can be used for baking cake in the coals; how to put biscuit dough on a stick for a break twist. (This would probably be done later, when the dough is ready for use.)

Discuss which jobs shall be done first, second and third?

Organize the campers into cooking groups (perhaps couples if they are using hobo stoves and four or five to a group if they are using large fires), and then dismiss them to begin their jobs.

Distribute food to each group. This may be done before leaving the kitchen if the groups are organized early. Each group can carry its own food; or the food may all be on the central table, where a representative from each group can pick it up when it is time to begin food preparation.

Check on the completion of all jobs which need to be done before fires are lit; distribute matches. One of the highlights of the cookout is the challenge and test to see if the camper has listened well, selected the right wood, and laid his fire properly so that he will succeed in lighting his fire with one match and become a member of the One Match Club. If a camper fails to light with one match, he must get his fire from the cookout fire of a more successful fire builder.

Cooking--

After the fires are lit, each group is largely on its own; but may need some hlep from the counselor in:

-Proper feeding of the fire.
-Reviving a fire that has died down.
-How to carry out some phase of the cooking.
-Removing baking foods from the coals.

Eating begins as soon as things are ready, the cooking of seconds or of slower items probably continuing at the same time.

Cleanup--

Cleanup procedures include:

-Collecting and burning trash.
-Distributing garbage and leftover foods in bushes for animals. (No broken packages of bread, etc. should be returned to camp.)

- Collecting and storing cans.
- Gathering equipment to be returned to camp.
- Extinguishing fires.

The teacher needs to give particular emphasis and his own personal supervision to the final cleanup operation of returning things to camp, cleaning and storing supplies. Give the campers help in washing utensils so that they will be sanitary and ready for the next cookout. Supervise the disposal of leftover foods.

- Whole loaves of bread to kitchen.
- Some foods should be put in the garbage can.

The evaluation should be delayed until all cleanup has been completed.

Evaluation--

Evaluation is an appreciation together of what the cookout experience has meant. Possible leading questions are:

- How many had a good time?
- Did you get enough to eat?
- How did it taste?
- Did you find out anything new about cooking?
- What did you learn about getting along in the out-of-doors?
- What things could have been done to make the cookout more successful?
- Did everyone do his share? Were any jobs left undone?
- Was the cookout areas, equipment and kitchen left clean and ready for the next cookout group?
- How many would like to try cookingout again some time?

Resting and Relaxing

The outdoor education curriculum is an active and vigorous program. In highly motivated activities conducted at an elevation of over 4,000 feet above sea level, it is necessary to give careful consideration to provisions for ample rest and relaxation.

The teacher paces his activity to meet the needs of the slowest and frailest campers. The counselor and the nurse are alert to signs of fatigue.

One of the most effective measures adopted at camp to provide for ample rest and relaxation is the scheduled rest period.

THE REST PERIOD

The rest period follows the noon meal. It is usually one hour in duration.

In camp, the children take off their shoes, lie down on their bunks, and rest or sleep to the sound of soft music.

In the cabin, the rest period is usually divided into two parts. The first half hour is to be quiet enough for anyone to sleep. The second half hour can be used for quiet activities, reading, writing, checkers, etc. This order may be reversed if desired.

In the field, the children may take several shorter rest periods, depending upon the weather.

Benefits children gain from the rest period include:

- An opportunity to relax.
- A chance to digest a meal.
- The prevention of overtiredness.
- A period for reflection about previous activities or things they have done.
- An understanding of why more rest than usual is needed.
- Consideration of others.
- Appreciation of good music.

Materials to have on hand for the rest period are:

- Record player.
- Good records to encourage quiet relaxation.
- Book, if story is to be read.
- Writing materials.
- Quiet games.

Procedures in the cabin:

Preparation period--

A brief explanation of "quiet time" is all that is necessary on Monday since the period following lunch is one of selecting beds, health inspection and orientation. A more complete orientation takes place Tuesday during the period preceding lunch in order that the children will know what is expected of them after lunch.

Discussion includes:

- Why do we need to rest?
  - Active program.
  - We have just eaten.
  - Elevation over 4,000 feet.
  - Less enjoyment if tired.
  - Sickness may result from overfatigue.
- Can we whisper?
  - Sound carries in the cabin; we will disturb others.

-Can we read books or write letters?

- Will it disturb others? (Secure books before "quiet time" begins.)

-Can we play games? Teachers have games available for second half of rest period.

-How can we rest best?

- Quiet, shoes off, lying down.
- Not disturbing others.

-Do we have the right to disturb another child who needs his rest?

-Can we go to the bathroom?

- The children go to the bathroom before entering the cabin.

-How should we enter the cabin after quiet time has started?

- Come in quietly.

Length of Quiet Time--

The period usually is about an hour, beginning when all children have returned from the dining room. DO NOT rush into quiet time; allow all children opportunity to use the bathroom, select a book, and settle down. Neglect of these points leads to disturbances later on. Expecially important is the bathroom problem. Rushing the child can lead to constipation and emotional problems. Obviously, some campers will need more rest or sleep than others, thus an air of rest and relaxation is necessary during the period. The first half of quiet time for sleeping; the second half for quiet activities.

Counseling Techniques--

The teacher, by his actions, sets the atmosphere for a successful quiet time. By moving among the children, speaking softly, taking care of individual problems, the mood is established. The teacher does not lie down until quiet time is well under way and established. To attempt to control the entire period from your bunk is ineffective.

Evaluation--

-Did you get a good rest?
-Did you like it to be quiet while resting?
-Were you pleased with the tone set?
-Did you enjoy listening to music while you were resting?

Procedures in the field:

Selection of a good resting place--

-Shelter from the wind.
-Dampness.
-Shade.
-Ground cover.
-Aesthetic appeal. (Listen to the sounds of the forest.)

Length of time--

-Varies with weather.

- Short frequent stops in cold weather.
- Longer stops in warm weather.

Counseling Techniques--

-Rest periods provide good opportunities to discuss many things of interest:

- History of area.
- Indian lore.
- Nature lore.
- Good time to discuss maps, compass information.
- Good opportunity for quiz games.

Evaluation--

-Stress satisfaction of lying down upon the earth and relaxing in serenity.

Sleeping well at night

With proper planning and a good approach, the children can be led to view bedtime not as an objectionable and necessary nuisance but as welcome activity to be anticipated because of the pleasant tone and enjoyable activities associated with it.

The approach to bedtime should be one of positive thinking wherein cooperative action on the part of children will make possible the enjoyment of some special treat, such as a bedtime story.

BEDTIME

Bedtime follows the evening program which ends at about 8:00 p.m. The children go to their cabins, wash, take care of toilet needs, and dress for bed.

After everyone is in bed and ready, a story may be told by the teacher.

A short period for quiet spiritual reflection is provided.

The child benefits from carefully planned bedtime activities because he:

- Gets a good night's sleep.
- Gains a sense of independence and maturity in sleeping away from home.
- Gains a feeling of security and protection in being cared for.
- Learns to consider the other fellow.
- Finds spiritual values.

Materials for the teacher to have available at bedtime include:

- Phonograph.
- Records; quiet music.
- Book to read.
- Flashlight.
- Health list to check for campers who may have problems of enuresis, sleepwalking, nightmares, medical care.
- First aid tray.

Bedtime Procedures:

Group discussion--

Gather the group together as soon as they are ready for a short discussion. Give a brief orientation about what they are to do, how they are to do it, so that they can get ready for the story.

- Explain that the sooner they are ready and quiet, the longer the story can be.

- Dawdling may result in a very abbreviated story.

> The teacher should be very hesitant to eliminate a story because of noise and lack of cooperation. This usually punishes the persons who are most anxious to hear the story and who have tried hardest to cooperate.
>
> Blanket penalties tend to lower morale by raising the question "Aw, what's the use? I've tried and I'm still punished."
>
> Plan to tell a story, even though brief, so that appetites will be whetted for the next evening.

- Explain rules about using toilet room after they are once settled in bed.

- Explain about need for reasonable quiet in getting ready for bed so that other cabins will not be disturbed.

- Remind about cabin group decisions about safety: running, horseplay, etc.

-Suggest cutting down on drinking.

-Remind about brushing teeth and washing.

-Explain procedures about going to toilet after group is settled.

-Explain about awakening in the morning and about rising times and procedures.

-Remind that teacher will be on duty at all times.

Establishing a tone in the cabin--

The teacher can do much to set the tone by his own example. He should try to be:

-Calm, assured, and obviously in control of the situation.
-Considerate, friendly and courteous in manner.
-Soft voiced.
-Patient.

Bedtime supervision--

As children get ready for bed:

-Play soft background music.
-Allow a certain amount of talking during this getting-settled period.
-Wait until later for complete quiet.
-Refrain from trying to communicate with camper from a distance.
-Wait until you are closer to him before you speak.
-If there is some need to speak to the whole group, do not try to speak above the voices of the children. Give the hand sign and wait for good audience attention.
-Wait until you have something important to say before you speak to the whole group.

  - Avoid too many interruptions.
  - Be alert to children who may be chief contributors to noise or confusion.
  - Counsel with leaders individually.
  - Circulate among children.

Providing for a spiritual reflection--

When the group is quiet, give a few words of inspiration and good fellowship. Explain that many of the children take time at home for prayer.

> "This is a time when each of us may want to think about the wonderful world we live in, our friends here and at home. We may want to express thanks each in our own way and express hope for a better world and ask for strength and guidance so that we can, in some way, help to make it a better world."

Follow this by a period of silence.

Telling the story--

The children seem to find a great satisfaction in hearing someone tell a story to them. Apparently the personal relationship of one person to another supplies something that is missing in the impersonal commercial character of radio and television.

Another factor contributing to the enjoyment of campers is the feeling of campers sharing an experience.

- A story told is much more effective than one that is read.

- Stories involving personal experiences are acceptable if good judgment is used in selection.

- A simple story with the ring of truth is much more effective than a story that depends upon exaggeration for interest. In general, children like to feel that there is a basis for truth in the story.

- Choose stories that are conducive to a relaxed night's sleep. Adventure and exciting instances with suspense are acceptable, but care should be used not to develop fears of the unknown. Snakes and the supernatural are better topics for daytime telling.

- After bringing the story to a close, taper off with soft music.

Taking care of individual needs--

The teacher should:

- Check the health list again.
- Set the alarm for 11:00 p.m.
- Awaken enuresis children for toilet at 11:00.
- Check cabin temperatures at this time and regulate.

Keeping Clean

Living closely together in groups at camp causes children to clearly recognize the need for cleanliness of person and of living quarters.

Some of the characteristics of camping are:

-It involves a lot of work.
-It is a "do-it-yourself" enterprise.
-It is a shared experience.

One aspect of the camp curriculum in which these characteristics are especially in evidence is the cleanup of cabin quarters and other camp facilities.

HOUSEKEEPING

Cleanup time follows the breakfast meal.

-Some campers will clean the cabin quarters, including shower room.
-Some will concentrate on the surrounding grounds.
-Some will clean other camp buildings.
-Some will work on special camp improvement projects.
-Some will stay in the dining room and wash dishes and sweep the floor.

The child benefits from housekeeping activities because he:

- Feels that he is carrying his load of the work involved in camping.
- Learns that work can be enjoyable.
- Learns some of the skills involved in good housekeeping.
- Feels satisfaction in a job well done.
- Participates in and contributes to a group project.
- Learns the advantages of sharing the work load.
- Feels proud of his clean, sanitary quarters.

Equipment used in housekeeping includes:

- Brooms
- Squeegees
- Disinfectant solution
- Mops
- Dust pans
- Sweeping compound
- Cleansing agents
- Cleaning rags
- Special tools for special projects

Housekeeping procedures:

Plan to involve every child in some way in the cleanup activity. Idle hands tend to lower morale at this time.

The cleanup activity is a valuable teaching opportunity. The main purpose of the cleanup activity is not just to end up with clean quarters; children grow in attitudes and understandings through their participation in this work.

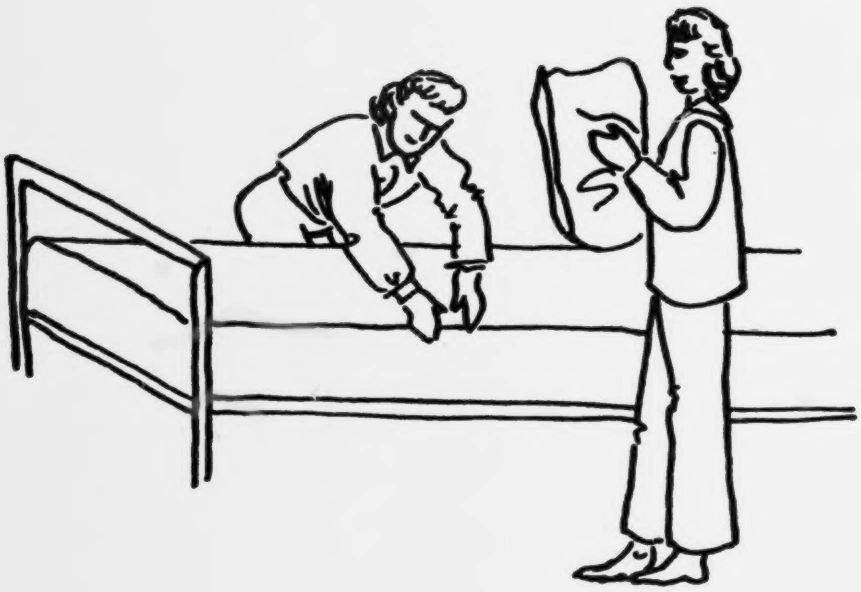
Giving cleanup orientation--

If possible, do your planning with the group before going to breakfast, so that every child has a clear idea of what he is going to do after breakfast.
Be sure to include in your planning some time for personal health needs immediately following breakfast.

Demonstrating--

Take time to demonstrate:

- The proper way to scatter sweeping compound.
- The most efficient ways of sweeping (with the grain and cracks) without raising dust.
- The use of window cleaning agents on cabin windows, mirrors.
- The way to clean walls.



Be sure that any "accidents" of enuresis cases are cared for before going to breakfast in an unobtrusive manner to spare the camper embarrassment. Sometimes it may be wise to take care of such "accidents" while the rest of the group is in the dining room.

-The best way to hang clothing and arrange personal gear.
-The use of squeegees and mops in shower room.
-The methods of washing down and sanitizing the shower room floor.

The cleanup activity becomes more interesting and enjoyable through the use of dramatic play and much humor.

One of the highlights of the camp experience is the "firing of the torpedoes" following the "count down" in the "submarine" (buckets of water splashed along the floor to be guided toward the objective by submariners with brooms and squeegees).

The final inspection by "Admiral Slushbucket" as he moves down the "flat top" inspecting each "jet" (bunk) and presenting the honor award (plumbers friend) to the cabin for a job well done, is a never-to-be-forgotten experience.

Evaluate the cleanup with children in terms of the expected benefits.

Personal Hygiene and Cleanliness

Shower time at camp provides the children with an opportunity for realizing some of the important objectives of the social hygiene program.

Many of the children have never before undressed or showered in the presence of other persons outside their immediate family.

Participating in a group activity that is accepted as a regular, normal feature of the camp program enables the child to take great strides in understanding himself better through observing that he is just about like his fellow campers in most ways.

The values of this activity extend far beyond cleanliness and sanitation into good mental health.

SHOWER PERIODS

There are usually three planned shower periods each week; Tuesday, Wednesday and Thursday. Shower time follows shortly after the end of the afternoon or all day activities.

In some of the facilities, the shower room is at one end of the barracks building. In other facilities, the showers are separate from the sleeping quarters and require a short walk to the shower house.

The child benefits from the shower period because he:

- -Enjoys the feeling of being clean and fresh.
- -Gains understandings about himself and his fellows.
- -Allays some of his fears and apprehensions by observing that, although everyone is different in some minor ways, they are all alike in going through progressive stages of growing up physically.
- -Is inspected by the teacher to check for rashes, ticks and anything that should be brought to the attention of the nurse.
- -Overcomes feelings of embarrassment and self-consciousness in undressing before others.
- -Learns the need for a clean mind and body.

Materials to have on hand at the shower period are:

- -Health summary sheet.
- -Record player with records.
- -Necessary menstrual supplies in girls' cabins.

Shower period procedures:

Two teachers should be on duty during shower time; one to supervise in shower room, the other to supervise in the sleeping quarters.

It is important to establish a wholesome, natural tone for this activity. The counselor must feel at ease himself and needs to be sensitive to the needs of individuals.

Some campers are faced with a greater problem in this area than are others. The counselor needs to be understanding.

CHAPTER VII

LEARNING ABOUT THE NEW CULTURAL ENVIRONMENT

THE CURRENT SCENE

The children find themselves in a completely new cultural environment at camp.

Each day they meet new types of people whose home and work are in the mountains. The students get to know the State Park Rangers and the U. S. Forest Service Rangers who visit camp frequently. They learn something of their problems and way of living.

The children meet the cowboys who are working with cattle. They see Indians on the reservations or just passing by. In the fall the children help the Indians gather acorns for food.

On the ride to their conservation work projects the children have a chance to stop to see the miners digging in the earth for precious minerals.

In visiting the great Palomar Observatory, the children meet outstanding astronomers and learn of their work at the observatory.

A RICH HERITAGE

Children make many interesting discoveries that open the door to the very interesting heritage of the region.

The abandoned Indian campsites with their great abundance of broken artifacts give mute evidence of the culture of the Indian before the coming of the white man. Old Indian traits and Indian names and legends help to bring the old days to life in the imaginations of the children.

Ruins of structures used by the early settlers aid in visualizing them at work and living at home. Remains of the old stage station tell the story of the "Jackass Mail Route" which passed directly through the present camp at Cuyamaca.

The camp and State Park museums help depict the story of the earliest inhabitants of the regions and subsequent contributions of explorers, settlers, ranchers, miners and foresters. The historical museum in Julian attests to the colorful gold rush days of this mining area.

The very names of the landmarks and State Parks themselves suggest the early history of the Spanish Explorers and missionaries.

CHAPTER VIII

LEARNING ABOUT THE NEW NATURAL ENVIRONMENT

THE OUTDOOR LABORATORY

The outdoor environment affords an opportunity for studying the natural laws and the forces that are constantly changing and influencing the scene.

Some aspects of the natural environment that are particularly suitable for investigation and experimentation at camp are:

- The limitless heavens with its family of planets and interesting constellations. The mystery of the universe itself spread out as a challenge to man's ingenuity and wisdom.
- The ever-changing ocean of air responding to differences in temperature and moisture in the processes of weather making.
- The rocks of the earth and the stories they tell.
- The topography of the land with such outstanding physical features as mountains, valleys, mesas and rivers.
- The thin layer of soil upon which life depends.
- The green mantle of plant life which carpets the land.
- The great variety of insects, reptiles, birds and animals that abound in the mountain region.

All of the different activities planned for learning in this field have the advantage of being closely related to first hand experience. The method of learning in the outdoors is exploration. The spirit of the learning is adventure. Included in the many kinds of learning activities are:

- Hiking to explore the natural environment.
- Listening to nature talks and demonstrations.
- Working in cooperation with natural laws and forces.
- Studying and preparing exhibits and displays in the camp.
- Using scientific equipment to measure and examine natural phenomena and forces.
- Discussing and evaluating evidence in order to arrive at conclusions.
- Reading reference material related to field investigations.

Major Benefits

The camper:

- Gains experience in using scientific methods of investigation; develops a scientific attitude and approach.
- Sharpens his powers of observation.
- Increases his interests.
- Learns to recognize natural forces and laws operating in the natural environment.
- Sees the relationships of cause and effect as they can be seen in the comparatively simple natural surroundings.

- Gains insight into the relationships existing within natural communities of living things.
- Gains understanding of man's relationship to his natural environment.

BASIC CONCEPTS OF OUTDOOR NATURAL SCIENCE INSTRUCTION

Some of the basic concepts and learnings that are planned as possible outcomes of science instruction at camp are grouped in the following paragraphs under the subject headings Soil, Air, Erosion, Water, and Plants and Animals.

Soil

Soil is one of the most important of our natural resources. Without it man could not exist.

- Soil is a mixture of rock particles together with decayed plant and animal materials called humus. In this mixture may be found many living things such as mold, bacteria and insects.

- The kinds of soil can be classified into three main types: sandy soils, clay soils, and loams.

- The layer of soil near the surface is called topsoil. Topsoil is more fertile than the subsoil beneath it.

- The rock that lies under the subsoil is called bedrock.

- At one time there was no soil. The solid part of the earth's surface was rock of some kind. All of the different kinds of rocks can be classified into three main groups:

    - Sedimentary rocks are formed from sediment (mud, sand, gravel, rocks) that settles to the bottom of water where the weight of water and more sediment presses it into rocks after thousands or millions of years. Sandstone and shale are common sedimentary rocks.
    - Igneous rocks are formed from hot molten lava that has cooled, sometimes rapidly and sometimes slowly. Granite and quartz are common igneous rocks.
    - Metamorphic rocks are formed when sedimentary and igneous rocks are changed by great heat and pressure.

- The process of change in rocks caused by exposure to the weather is called weathering. Weathering changes rocks in many ways:

    - Gases and acids from the air combine with minerals in the rock to soften and loosen particles.
    - Water flowing over rocks dissolves some of the minerals and carries them away.
    - Water seeps into cracks and freezes. The expanding ice forces the cracks wider and breaks the rock into smaller pieces.

- Differences in temperature between the outside and inside of rocks cause them to crack.

-Plants and animals also help to break rocks.

- The roots of plants as they grow larger break up rocks.
- Animals and insects burrow in the soil and bring water and chemicals to the bedrock.
- Plants (lichens and mosses) growing on rocks weaken the surface structures.

Air

Air is one of the natural resources that is often overlooked because we take it too much for granted. There could be no life without air.

-Air is a mixture of oxygen, nitrogen, carbon dioxide, water vapor and many other kinds of gases that are essential to life. Air also contains many particles of dust and other solids.

-Air occupies space. It can move from a particular space but it cannot leave a void or a vacuum where it was. Other air moves in to occupy the space.

-Air can expand and contract. It may become very "thin" or it may be compressed.

- Air expands and becomes lighter in weight when it is heated.
- As air rises it cools.

-Air flows like a fluid. Light, warm air tends to rise above heavy, cool air, while cold air settles to the ground.

-Air is heated unevenly over the surface of the earth because of the rotation of the earth, seasons and topography, and because of the difference in materials that cover the surface of the earth. As air is warmed, it expands and rises to cause surface wind as cooler air moves to where the warm air was.

-The amount of water vapor that air can hold depends upon the temperature of the air.

- When air holds as much water vapor as it can, it is saturated.
- The warmer the air, the more water vapor it can hold before it becomes saturated.
- The temperature at which air becomes saturated with water vapor is called the dew point.
- When air is cooled below the dew point, water vapor condenses (changes to liquid) on dust or other particles in the air to form rain.

-As rain falls through the air, it dissolves some of the carbon dioxide gas from the air to form a weak carbonic acid. This acid helps to dissolve some of the minerals of the earth.

- Some of the gases of the air are used by plants and animals. These gases are later returned to the air. The oxygen-carbon dioxide cycle is one example of how gases are used, changed to new gases, recombined and used again.

Erosion

In many parts of our country, soil is being transported from the surface of the land faster than it can be made.

- Water and wind are the two main causes of soil erosion.

- Water causes two different kinds of soil erosion.

    - Sheet erosion, where water wears away the topsoil in thin layers. Sheet erosion may cover wide areas.
    - Gully erosion, where concentrated running water digs gullies as it flows to lower levels. Gully erosion often follows sheet erosion.

- Factors affecting soil erosion are:

    - The amount of rain that falls.

        - It is not always true that the greatest erosion is found where there is the greatest amount of rainfall.
        - Large amounts of rain distributed evenly will usually result in a heavy growth of plants that will protect the soil.
        - In regions where there is usually little plant covering because of little rain, there may be a great deal of erosion caused by sudden, severe cloudbursts.

    - The steepness of the slope of the land. The steeper the slope, the faster water will flow downhill. The faster water flows, the more power it has to cut and carry soil away.

    - The kind of ground covering.

        - When drops of water fall upon bare earth, the force of impact of the drops act like many tiny hammers pulverizing the earth. This loosened soil is washed away rapidly by the rain.
        - A ground covering of green plants provides many leaves which act like tiny umbrellas to cushion the force of the falling drops and allows them to roll or fall lightly from the leaf to the ground.

    - The kind of soil.

        - Some soils are coarse and porous and allow the rain water to seep readily below the surface to become underground water.

        - Some soils are cemented together with enough clay to resist erosion.
        - Loose topsoil is often washed away readily.

    - The speed of the wind. The effect of the wind as an eroding agent depends upon some of the things that influence water erosion. In general, there is greatest wind erosion when the wind is strong, there is no protecting vegetation, and the soil is loose and dry.

Water

Water is of the utmost importance to living things because they are made up largely of water. About three-fourths of the human body is water.

- Water is a combination of the two gases, hydrogen and oxygen.

- It possesses the following very important characteristics:

    - It is found in three states--solid, liquid, or gas.
    - In the liquid state you can drink it or pour it.
    - In a gaseous state it is water vapor.
    - In the solid state it is frozen as snow or ice.

- Water changes readily from one state to the other under certain conditions.

    - Water changes from a visible liquid in pools, streams and oceans by evaporation to become invisible water vapor in the air.
    - The water vapor (gas) in the air changes (condenses) into tiny drops of liquid that may float in the air as a part of a cloud.
    - The tiny droplets may grow larger until they become heavy enough to fall (precipitate) as rain. Some of the falling rain will again change to vapor and some may change to hail or sleet.
    - If it is cold enough, the water vapor will condense as snow crystals and precipitate as snow.
    - The rain water may flow downhill or seep into the ground.
    - The falling snow may remain in the solid state or melt to behave as rain water.

- As a liquid, water responds to the laws of gravity: it flows downhill, it seeps or percolates down through materials, and it falls through the air.

- Water has weight and when moving exerts a force that tries to move things. The faster water moves, the greater force it has to move things and the greater load of soil it can carry in suspension.

- Water dissolves more different kinds of minerals than any other liquid. Water is able to transport dissolved materials in solutions. Water which contains calcium and magnesium minerals in solution is sometimes called hard water. Many minerals dissolved in water finally become a part of the salty ocean solution.

Plants and Animals

All living things are either plants or animals. Living things have the following characteristics: they need food, they breathe, they grow, they reproduce themselves, and they adapt themselves.

Food:

- Green plants manufacture food in the presence of sunlight by combining carbon dioxide from the air and dissolved minerals from the soil.
  - The food is manufactured chiefly in the leaves.
  - The green coloring material is called chlorophyll.
  - The process of food making is called photosynthesis.
  - The manufactured food is stored mainly in the stems and roots.
- Plants that are not green cannot make their own food and so depend upon other green plants. These are the mushrooms, molds, yeasts, bacteria and other fungi.
- Some plants use the food that green plants have already made by taking it from the living plant (parasites).
- Some plants use the food from plants that have died (saprophytes).
- Some plants manufacture their own food but rob moisture and minerals from the living plants (mistletoe).
- Some plants cooperate together to get food. Lichens are a union of algae and fungi and exist by a process called symbiosis.
- The green plant, in manufacturing food, releases the very important byproduct of oxygen into the air at the same time it uses carbon dioxide from the air.
- Every living thing is dependent upon other living things for food in an endless chain. Rodents eat plants; birds of prey eat rodents; large carnivores eat small carnivores. Insects, plants and bacteria consume all dead things to provide food in the soil for plants which are the foundation for the great pyramid of living things.

Breathing (respiration and transpiration)

- All animals breathe in oxygen and breathe out carbon dioxide.
  - This process would, in time remove the oxygen from the air and replace it with carbon dioxide except for the fact that in food making, the green plants keep the air balanced by using carbon dioxide and giving off oxygen.

- •Living things return much of the water they use to the air.
- •In plants this process is called transpiration.

Growth

-All living things are composed of cells that multiply to form tissues, organs, and systems that can be identified as particular plants or animals.

-There are many different kinds of plants and animals. They can be classified in many different ways.

-Plants may be grouped according to the method of reproduction.

- •Plants which reproduce by spores are:
  - -Bacteria including blue-green algae.
  - -Algae including green, yellow-green, brown and red forms.
  - -Slime molds.
  - -Fungi including molds, mildews, yeast, rusts, lichens, and mushrooms.
  - -Mosses including liverworts.
  - -Ferns including horsetails.
- •Other plants produce seeds, flowers and fruit. Every part of a seed-producing plant has a particular function:
  - -Roots anchor plant, store food, provide a means of assimilating moisture and minerals.
  - -Stems support plant, transfer food, minerals and moisture between leaves and roots, store food and water.
  - -Leaves manufacture food, provide an area for carrying on respiration and transpiration.
  - -Flowers develop fruit and seeds for reproduction of species.

-Animals are classified into many groups according to structure and habits. All animals can be included in two large groups.

- •Vertebrates (those having a backbone)
- •Invertebrates (those without a backbone)

Reproduction

-Living things are able to reproduce their own kind.

- •Plants produce offspring in various ways. The simplest plants reproduce by dividing or budding.
- •Spores differ from seeds in that they do not have stored food to start the plant growing.
- •Spores are produced in great numbers and depend on the wind to carry them to a suitable environment. Most spores die.

-Seeds always contain enough food to produce a young plant until it can grow roots.

-All flowering plants produce seeds.

-To produce seeds it is necessary for pollen from a flower to fall on the egg cell of a flower (pollination).

-Plants are pollinated in many ways:

- Self-pollination. (The flower fertilizes itself. Flowers are unattractive with little scent.)
- Cross-pollination. (Two separate flowers are required.)
- Pollen carried by wind.
- Pollen carried by insects. (Flowers are usually brightly colored with a pleasant odor. Insects carry pollen on back and legs.)

-Seeds are transported in many ways:

- Birds and other animals spread seeds in droppings.
- Wind carries seed that is especially equipped with sails--parachutes.
- Cones, acorns, etc., drop and roll downhill.
- Pods burst open with explosive force.
- Seeds with claws hook onto fur of animals.

-Animals reproduce in various ways:

- Simple animals produce just as simple plants do by dividing or budding.
- The young of some animals are hatched from eggs.
- Eggs must be fertile to hatch. They must contain two cells, the male sperm and the female ovum.
- Eggs are similar to seeds.
- The young of some animals grow inside the body of the mother.
- Animals generally have fewer offspring than plants have seeds.
- Animals that produce fewer young need to have greater protection.

Adaptation

-Living things compete in a struggle for existence.

-Their survival depends upon their ability to adapt to their environment. The environment or habitat of living things is composed of many segments:

- Extremes of temperature.
- Amount of moisture.
- Intensity of sunlight.
- Topography.
- Soil conditions.
- Elevation.
- Kinds of surrounding plants and animals.

-In their struggle to survive, living things have adapted themselves in many ways to their environment. Plants adapt themselves to climate through the following:

- Shape and size of leaves to reduce evaporation.
- Varnishes and other coverings to reduce evaporation.
- Extensive root systems.
- Elaborate storage systems.
- Devices to increase tolerances to shade and sunlight.
- Ability to become dormant and lose leaves in winter.

-Animals adapt to climate in many ways.

- Covering of hair or fur in cold climate.
- Ability to perspire for cooling in warm weather.

-Animals adjust themselves to seasonal changes.

- Migration (moving to a warmer climate).
- Hibernation (sleeping with decreased body functions).
- Metamorphosis (changing into a different form).

-Animals adapt to other living things.

- Development of characteristics that attract, such as color, odor, taste, form.
- Development of cooperative relationships that are beneficial:

  -Insects - flowers (food, reproduction).
  -Birds - fruit (food, reproduction).
  -Squirrels - nuts (food, reproduction).
  -Algae-fungi - symbiosis (food, water).
  -Photosynthesis - respiration (balance of gases).

-They adapt for protection.

- Protective coloring.
- Bitter or acid taste.
- Repulsive odors.
- Irritants and poisons.
- Spines.
- Armor.
- Speed of movement.
- Claws, teeth for fighting.
- Immobility.
- Machinery for digging escape routes.

-Environments where plants and animals live together "in balance" are called communities. There are many different kinds of plant-animal communities. Only certain plants and animals can be expected to be found in each community:

- Evergreen woods.
- Deciduous community.
- Field community.

- Meadow community.
- Swamp community.
- Pond community.

-When plants and animals are not able to adapt to their community, they must move or die out.

- No plant or animal can exist independent of other living things.
- Man must be careful in reshaping his environment so that he will not upset the balance in life communities to his own long-range detriment.

CHAPTER IX

PARTICIPATING IN OUTDOOR SCIENCE ACTIVITIES

EXPLORATORY HIKES

Point of View

One of the most exciting adventures included in the outdoor education program is hiking to explore the unknown. Considerable emphasis should be given to differentiate between the exploration hike and the usual hike to get from one place to another or to train for endurance. There are no "endurance hikes" included in the outdoor education program. Hiking as a means of transportation is done incidentally and instruction for improved hiking is included in the program. The values of hiking are many. Hiking to explore encompasses these values and adds many more.

Exploring and observing in the natural environment promotes in children a feeling of intimacy with nature. The smell of the soil and growing things, the sound of the busy forest community, the fresh beauty of nature's colors and the feel of soft moss and rough bark promote a very personal relationship between the child and the natural world about him.

This feeling of intimacy leads to increased appreciation of the beauty and design in nature that results in a feeling of spiritual uplift. The child's concept of his natural heritage and his relationship to it should grow not only from intelligence; it should grow out of strong emotional and spiritual feelings.

Overview

The exploration program is planned so that the hikes are short and easy at first and get progressively longer as the week advances. This enables the teachers to observe individuals to see if they should be limited to shorter hikes during the week. It also enables the child to get the feel of hiking and gain a basis for determining whether he wants to select a hike for the following day. The gradual approach to hiking also aids in conditioning the campers in using new muscles at an elevation of over 4,000 feet.

Some of the kinds of hikes included in the program are:

- Orientation hike following tour of camp.
- Craft hike in morning before work with craft materials.
- Hiking as a part of another activity, such as a cook out or conservation.
- Night hikes to study stars, and listen to the sounds of night.
- All day exploratory hike.

There are many choices of exploratory hikes offered to the student. Each hike has some special highlight. Each hike is quite different from all other hikes, yet all hikes are essentially the same as far as procedures and possible outcomes are concerned.

Some of the all-day exploratory hikes that have proven to be very popular at the school camps are:

Camp Cuyamaca

Beaver Valley (Green Valley Falls)
West Mesa
East Mesa
Rock Canyon

Camp Marston

Cedar Creek
North Peak
McGee Flats
Dehr Creek

Camp Palomar

Lower Doane Valley
Sunday School Flats
Boucher Lookout
French's Valley
Frye Creek

Every hiking group is supervised by two teachers. One of these may be a classroom teacher or teacher aide.

The all-day exploratory hike is described in detail here because it contains all of the essential aspects of the other hikes.

Expected Outcomes

In addition to the benefits to the campers described in the introduction to this section, the following may be expected from the exploratory hike:

The hiker:

- -Develops a desire to keep himself and others safe.
- -Develops skills in safety and survival.
- -Develops a feeling of personal, intimate relationship with the natural community of which he feels a part.
- -Experiences the thrill and anticipation of approaching the unknown.
- -Learns the skills of stalking birds and animals.
- -Gains appreciation of the constant struggle for existence.
- -Gains awareness of a design in nature, a Master Plan in which there is order and purpose in life. Senses a personal relationship in this Master Plan.
- -Gains appreciation of problems of survival of early Indians, Spaniards and Settlers.
- -Develops knowledge of rules and regulations operating in California State Parks and understands why it is necessary and desirable to have such rules and regulations in order to maintain and perpetuate this choice wilderness area.
- -Gains experience in using maps and compasses in determining location and routes.
- -Learns value of pacing and conserving strength through frequent rest stops.
- -Practices good outdoor manners.
    - -Collecting and removing litter.
    - -Not marking trees, etc.
    - -Not disturbing the natural scene.
- -Gains many science learnings.

Materials

- -First aid kit.
- -Compasses.
- -Maps and pencils.
- -Binoculars.
- -Rucksack for lunches and to return trash.
- -Snake stick.
- -#10 cans for carrying milk cartons.
- -Canteens for water.
- -Sack lunches.
- -Paper cups.
- -List of campers.
- -Magnifying glasses.

Hiking Procedures

Getting group together:

At morning activity assembly, move to the front of the group and receive the campers who have signed up for the hike as their names are called out.

Preparing to leave:

Keep hike group orderly and quiet. When your group is complete take them away from the general meeting and give instructions about:

- -Last opportunity for toilet facilities before leaving camp.
- -Kind and amount of clothing to wear.
    - •Foot gear.
    - •Jackets.
    - •Hats.
- -Physical fitness. Check with health sheet and nurse.
    - •Remind about ointment for lips.
- -Equipment to carry.
    - •Cameras.
    - •Magnifying glass.
    - •Knives.
    - •Personal canteens.

Ask students to go to cabins to make last minute preparations and then return to designated place. Take this time to make your own last minute preparations. Work with your staff partner in planning supervision and direction of hiking activity.

As the children return from their visit to cabins after about five minutes, ask for volunteers from first arrivals to:

- -Help get canteens and fill with water.
- -Decide which hikers will start carrying water.
- -Help get #10 cans and other equipment.

After all campers are together, go to dining room to get lunches.
Distribute:

- -Lunches - one per camper.
- -Milk into #10 cans.
- -Paper cups.

Since the children are anxious to get started, save orientation discussion until the group has hiked out of sight of camp.

Giving safety orientation for the hike:

Some of the points to cover in discussing safety on the trail are:

- -Getting lost.
    - •It is easy to get lost in strange country.
        - -Make sure that someone in camp or at home knows where you plan to go.
        - -Stay with your group.
        - -Learn to use your compass or watch as a compass.
        - -Notice landmarks at all times.
        - -Stay out of the brush if you do get lost. Don't get excited, help will come.
- -Rocks and cliffs.
    - •Wear rubber-soled shoes.
    - •Avoid pushing and shoving.

- Don't take unnecessary chances.
- Try not to dislodge boulders that may roll.

-Limbs and twigs that blind.

- Be sure that no one behind you will be slapped by a springy twig as you let go of it. Hold the twig for him if necessary.
- Stay a safe distance behind the person in front of you.

-Blisters.

- Wear comfortable shoes and socks. Avoid cowboy boots--they are not for hiking.
- Check sore spots that might develop into blisters.
- Report any blisters to the counselor or nurse.

-Cramps and heat exhaustion.

- Drink sparingly.
- Rest after eating.
- Thin air in high altitudes means more rest is needed.

-Poison Oak.

- Wear long sleeves.
- Learn to recognize it.
- Avoid by staying with group.
- Immediately wash with soap if contacted.

-Rattlesnakes.

- Wear trousers and heavy shoes.
- Be alert! Watch hands in climbing.
- Avoid any snake; it might be a rattler. Don't kill any.
- Stay with the group on the trail, especially during snake season.
- Check to see that someone in your group has a snake bite outfit.

Technique of Exploring

The technique of exploring has some significant advantages. It:

-Directly involves the individual hiker.
-Encourages observation and an inquiring mind.
-Is interesting and exciting.
-Allows for a play of imagination.

Exploring should contain elements of drama.

The teacher should plan to create within each hiker an attitude of expectation, a feeling of anticipation, and an atmosphere of suspense which heighten the satisfactions of culminating with discovery. These feelings of satisfaction come primarily to the discoverer. Fellow hikers may enjoy satisfactions in sharing the discovery vicariously but they will miss the strong emotional impact felt by the discoverer. Plan so that there will be many discoverers.

In order to capitalize upon the advantages of using the elements of drama involved in exploring, the leader must:

- Be familiar with the hiking terrain so that he knows many things that are potentially exciting "discoveries."
- Anticipate discoveries beforehand so that he can set the stage and atmosphere for discovering.
- Give enough clues to hikers to provide them with background basis for making the discovery.
- Stay in the background so that the discovery is not teacher-dominated.
- In case the discovery is missed, be prepared to give enough additional clues to insure discovery.

Some of the natural phenomena that are potentially good discoveries are:

- Birds. These may appear unexpectedly and will give motivation for "bird watching."
- Animals. A favorite aspect of the exploratory hike is animal stalking. The hikers gain a sense of accomplishment in learning the skills of stalking so that they can approach animals without disturbing them. This is a challenging enterprise in cooperative action.
- Soil profile.
- Tree stump.
- Animal tracks.
- Erosion scar.
- Rotting log.
- Indian camp site.
- Historical ruins, early settlers.
- Erosion control work.
- Beetle damaged trees.
- Burrow or den of animal.
- Beaver pond or cutting.
- Decomposing granite.
- Clay bank.
- Stream.
- Bird nest.
- Reproduction in the forest.
- Lichens and mosses.
- Work of woodpecker on trees.
- Poison oak.
- Interesting plants.

    - Unusual.
    - Used by Indians.
    - Used today.
    - Edible or medicinal.

- Evidence of forest fire.

Countless other phenomena can be added to this list and the teacher will be able to make more interesting discoveries as he applies himself to research in the field.

Throughout the exploratory hike the hikers should be encouraged to develop an inquiring mind. Encourage the hikers to see and, seeing, ask: What? Why? How? Emphasize the importance of reading in the outdoors. (Refer to "Reading in the Outdoors" in appendix.)

Throughout the hike, especially during rest periods, give instruction in map and compass work. Distribute maps and compasses to the hikers early so they can be using them as they hike along. (See section on "map and compass.")

At some time later during the hike, in a place where it would be easy to get lost, approach the problem of survival in the wilds by imagining with the hikers that each is lost by himself. (Refer to "Survival in the Outdoors" in the section on health and safety.)

Lunch on the hike.

Select a site in advance for lunch so that it will provide comfort against the weather and ground covering. Consider such factors as:

-South slope for warmth.
-Shelter against wind.
-Shade of trees.
-Logs or rocks for dryness.
-View, aesthetic appeal.
-A place to lie down.

Make sure the site is clean of all litter before leaving.

Quiet time on the hike.

The weather will influence the extent and kind of quiet time on the hike. Warm weather makes possible a delightful communion with nature while stretched out on the leaves. Cold weather may require many short rest periods to prevent chilling through inactivity.

Quiet time is an excellent opportunity for the teacher to tell an Indian legend or to give interesting historical or other information relating to the area.

Hiking formation.

During snake season the hiking group moves in single file with a teacher at the head of the line and a second adult at the end of the line. Single file formation is also used along narrow trails or in places of hazard where a teacher gives individual supervision.

In wintertime the Indian file should be discouraged wherever possible in favor of an informal grouping with all hikers behind the teacher. Such grouping provides a better audience situation for comments, questions and instructions.

Pacing

The teacher at the rear of the group determines the speed of the hikers. He will set the pace to suit the needs of the slowest hiker. He keeps the leader informed about pace. It is helpful to move habitual stragglers up with the lead teacher. Time the hike so that it will not be necessary to make a forced march in order to return to camp on schedule.

If it appears that the group will arrive early at camp, select a spot while still out of sight of camp for a short evaluation of the hike. Questions which might stimulate discussion are:

-"Did you enjoy the hike?"
-"What did you learn?"
-"What are some of the new experiences you have had?"
-"How could the hike have been improved?"
-"Are there any interesting parts of the hike you would like to share with the other campers during the evening program?"

If time allows, plan a short skit, charade or pantomime to depict particular aspects of the hike.

Upon returning to camp, inform campers about where they should go and what they should do. Check in all supplies, equipment and store them in the proper place.

EXPLORATORY HIKE FOR CHILDREN WITH HEALTH PROBLEMS

Point of View

Not all children are interested in or are able to hike all day in the forest. These children should have an opportunity to explore the natural environment at their own pace for a shorter period of time.

Overview

The camp nurse decides which children should be restricted from the all-day hike and which are able to participate in the restricted exploration. Some children may be further restricted from hiking of any kind.

The short exploratory hike involves a short hike (about ½ mile) over comparatively level terrain. The hike is done leisurely so that the physically handicapped will not be extended in any way.

Usually the hike takes place in the morning. The afternoon activities take place in or near camp. Some of the activities are:

-Arts and crafts
-Fishing
-Quiet rest
-Dramatic activities
-Science experiences
-Map and compass

Expected Outcomes

Same as those for all-day exploration hike.

Materials

Same as those for all-day exploration hike.

Procedures

In general, the same procedures used in the all-day exploratory hike apply to this restricted version.

It is important to consider the state of mind of these children, some of whom are left in camp through no choice of their own. They watch the other campers enthusiastically making preparation for their hikes with expectation of adventure, excitement and fun. If you let the children dwell on these thoughts long, your chances of having a successful and interesting activity dwindle, because they may become disgruntled and not interested in doing anything but sulk.

It is at this time that you quickly give your restricted hikers the same hiking-trail-safety orientation (because you are leaving camp) being received by the rest of the camp. This helps to prevent that left-out feeling.

It is helpful to leave camp in about the same manner and time as the other groups. As soon as camp has been left behind, even if it only means hiking around the bend, gather your group around you and discuss plans for a day of adventure and fun in which the thrill of discovery and Indian lore explorations are included.

Using one technique, the teacher might say, "I understand there is an Indian village campsite over the hill somewhere and I've always wanted to find it. How about joining me and explore the forest until we find it?" These opening remarks might stimulate interest, fulfillment of adventure to be encountered, and perhaps, a new direction to their thoughts.

From this idea might develop a discussion of what the hikers might expect to see if they come upon a campsite: where it might be located; the signs and indications; and how it could be recognized. This could include nearness to water, cacti, boulders (for morteros), manos, metates, ollas, pieces of pottery, stands of oak and pines, wild buckwheat, tule reeds, Indian tobacco, and ground that has been darkened with ashes.

With some Indian lore understanding, the children usually find the experiences of the exploration much more meaningful and enjoyable. The thrill of each discovery is a delight to see, a thrill to experience, and a satisfaction for the teacher.

The teacher must play his role with enthusiasm and delight in the discovery along with the campers. Each new discovery must appear to be a new discovery and a new thrill for him. This spirit of adventure and new excitement will be reflected in his group of campers and result in an experience worthy of the activity--satisfactory, enjoyable and educational, with all the irritations and dissatisfactions of being left behind thoroughly forgotten.

Upon returning to camp at noontime, the children wash and pick up their lunches at the dining hall. They then proceed to an eating area of their choice, preferably out of sight of camp.

If another teacher takes over the group from the end of lunch through the afternoon activity, it is vital that he be oriented as to what has been done during the morning and perhaps the group's decision as to what their interests are for the afternoon activities.

The quiet time which follows lunch can be held either outdoors or in the cabins, where, after they have rested quietly on their beds for a while, a quiet game, story or music might be in order. An Indian quiz game pertaining to the morning's activity sometimes adds enjoyment.

Whatever the activity may be, it is carried on in a relaxed, easy-going manner, with attention given to the health needs of all the campers.

An informal evaluation of the experiences may point up the fact that the Indian camp was highlighted by some very interesting experiences.

WEATHER REPORTING

Point of View

Weather is of special interest to campers in the mountains because it plays an important part in determining the kinds of activities that they may include in their program. It may be too cold, wet or windy for an outside activity, or the fire hazard may be too high for cookouts or conservation burning. Mountain weather is often spectacular and dramatic to observe.

In the limited time available for weather reporting at camp, emphasis should be given to developing concepts of relationships and cause and effect of weather. There will probably not be enough time to explain about the structure and technical operation of weather instruments. Such explanations might appropriately be given to the committee responsible for making the report.

Overview of Activity

Weather reporting at camp is usually done by a team or committee composed of boys and girls representing cabin groups. The classroom teachers suggest names of children who, because of interest and aptitude, may contribute to post-camp classroom activities in studying about weather.

The committee meets on the first day with a teacher who explains about the instruments in the camp weather station and the way they measure aspects of the weather.

Each student accepts responsibility for a particular instrument and prepares to report to the group about the reading of the instrument, how the reading was made, and what the implications in terms of weather are. The forecast is a very important feature of the report.

The readings are recorded upon forms set up for reporting. Each reporter takes a form to his cabin where he posts it for others to study. The daily reports are entered on a large, long-range reporting chart that is centrally located for all to see. At the end of the week he takes it home for use in post-camp follow-up in the classroom.

Procedure for Weather Reporting

Reporting about the weather should be done by students, not by the teacher. The teacher may give a short introduction to the report but his chief aim will be to instruct the reporters so that they will:

-Understand what they are reporting.
-Understand why they are reporting.
-Be able to express themselves clearly to the group.
(This is an excellent opportunity for language instruction. See suggestions in oral language section.)

Suggestions for leading and guiding questions:

What is weather? (The condition of the atmosphere about us.)

Warmth or coldness of air. (temperature)
Dampness of the air. (humidity)
Amount and kind of moisture falling through the air to the ground. (precipitation)
Movement of air. (wind)
Weight of the air. (pressure-weight pressing down)

Why should we be interested in the weather? (We can't do anything about changing it but we can plan our activities to cooperate with it....work with nature.)

How can we learn what the weather is? (Measure it.)

What are some of the instruments that are used to measure weather?

- -Temperature - Thermometer
- -Highest and lowest temperature for any period of time - Maximum-Minimum thermometer
- -Humidity of the air - Psychrometer (called a sling psychrometer because you sling it around to use it)
- -Precipitation falling to the ground - Rain gauge
- -Wind, speed - Anemometer (anemos-wind)
- -Wind, direction - Wind vane
- -Air pressure - Barometer

Weather committee reports

Let each member of the reporting team describe one of the weather instruments. If feasible, each reporter should hold the instrument while speaking.

Thermometer--

"The thermometer measures how warm or cold the air is at any particular time. Heat and cold cause the mercury or alcohol in this column of glass to swell or shrink. When it is hot the mercury swells until it reaches this point telling how hot it is. Cold shrinks the column away down here where it says freezing."

Maximum-Minimum Thermometer--

"This thermometer can tell the hottest (highest) and the coldest (lowest) temperatures of the air over a longer period of time. At night when it gets cold, the column of mercury moves up on this side, pushing this little marker along inside the glass tube as the mercury moves down.

"This column measures how cold it is so we call it the minimum or lowest point reached.

"In the daytime when the air is warmer, the column of mercury moves in this direction so that this column will rise and cause this marker to be pushed up in the glass tube.

"This column measures how warm it gets so we call it the maximum thermometer since it measures the maximum or highest point reached.

"As the mercury moves down in the minimum column the marker stays in place marking the lowest point reached. In the same way, the marker in the maximum thermometer stays put at the highest point to show how hot it was at the hottest time during the period."

Psychrometer--

"The psychrometer measures how damp or how dry the air is. It has two thermometers. One of them is just like any thermometer and measures the temperature.

"The other thermometer has a sleeve of cloth on one end which is dipped on water to make it wet. When the thermometer is wet, it becomes cooler just as your finger does when it becomes wet. Your finger feels cooler as wind blows upon it or as you swing it through the air. This is because the water is evaporating and evaporation cools things. The faster water evaporates on something, the cooler it becomes. Water evaporates faster in dry air than in damp air.

"If the wet thermometer is much colder than the dry thermometer is, it means that the air is dry.

"If there is not much difference between the wet thermometer and the dry thermometer, it means that there is little evaporation because the air is damp.

"The difference between the temperature of the wet bulb and the dry bulb tells just how damp or dry the air is."

Rain Gauge--

"The rain gauge tells how much rain or hail or sleet or snow falls to the ground.

"The rain falls into this wide hole and runs down the funnel into a brass container which helps us to measure the amount of rain water more accurately. When it snows the funnel should be removed to let the snow fall in without clogging the hole."

Anemometer--

"The anemometer measures the speed of the wind. The wind causes these cups to move around like a propeller. A strong wind causes the cups to rotate rapidly. When the air is calm, the cups do not move.

"The cups are connected by electric wires to a switch and a buzzer which operates by batteries. Every time the cups turn around a certain number of times the buzzer buzzes if the switch is on. The faster the cups rotate the more often the buzzer will buzz. If you count the number of buzzes you hear for two minutes you can tell by reading a chart just how many miles an hour the wind is moving."

Wind Vane--

"The wind vane tells the direction that the wind is coming from. It is marked with the four points of the compass with North pointing toward true north."

Barometer--

"The barometer measures the air pressure which means the weight of the air pressing upon the instrument. The higher it goes into the air, the less air there is above to press down upon it. There is less air above us here than there is in San Diego so the pressure here is less than it is in San Diego.

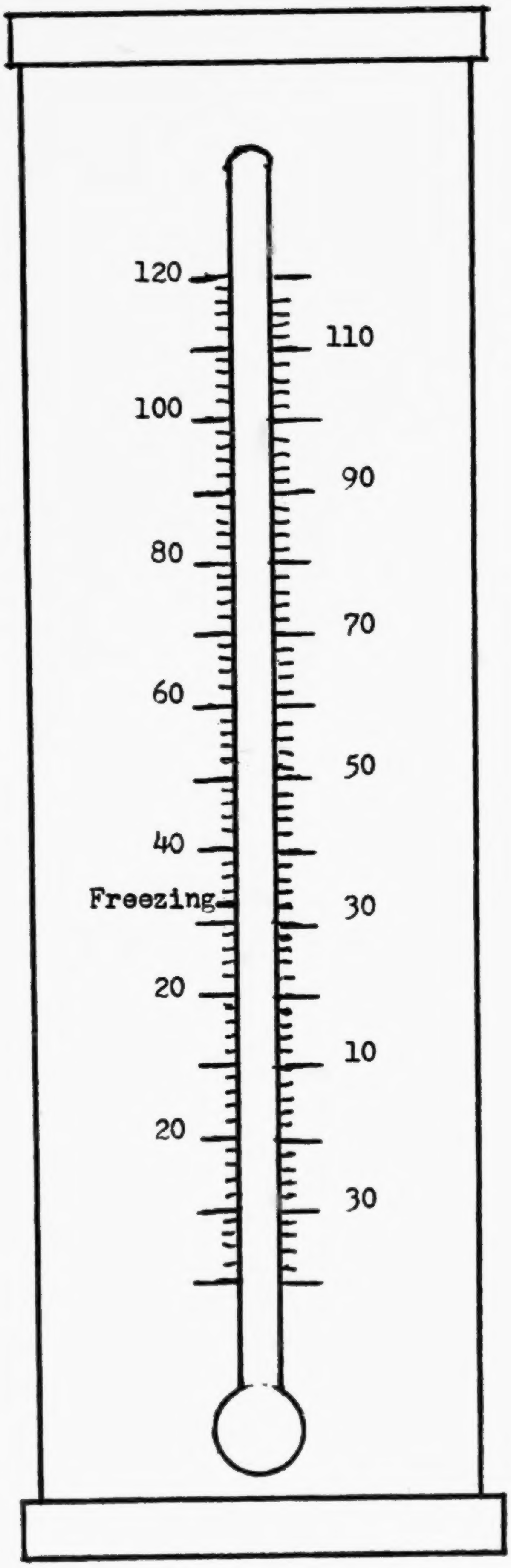
"The pressure of the air at sea level is enough to cause a column of heavey mercury to rise 30 inches in a glass tube. The weight of the air above us here at camp will raise the same column of mercury only about 25 or 26 inches in the glass tube. There are different kinds of barometers; some with tubes of mercury and some with metal plates. This barometer has metal plates that the air presses upon to cause a pointer to move. This is an aneroid barometer.

"Since changes in altitude cause changes in the reading on the barometer, we can tell by reading the barometer just how high we are. This is how an altimeter in an airplane works."

Date________________

	MONDAY		**TUESDAY**		**WEDNESDAY**		**THURSDAY**		**FRIDAY**	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
TEMPERATURE (Thermometer)										
High (Maximum)										
Low (minimum)										
HUMIDITY (Psychrometer)										
Dry										
Wet										
Relative humidity										
PRECIPITATION (Rain gauge)										
Kind										
Amount										
SKY										
Kind of clouds										
Amount of clouds										
AIR PRESSURE (Barometer)										
WIND										
Direction										
Speed										
VEGETATION										
Fuel moisture										
FORECAST										

THERMOMETER

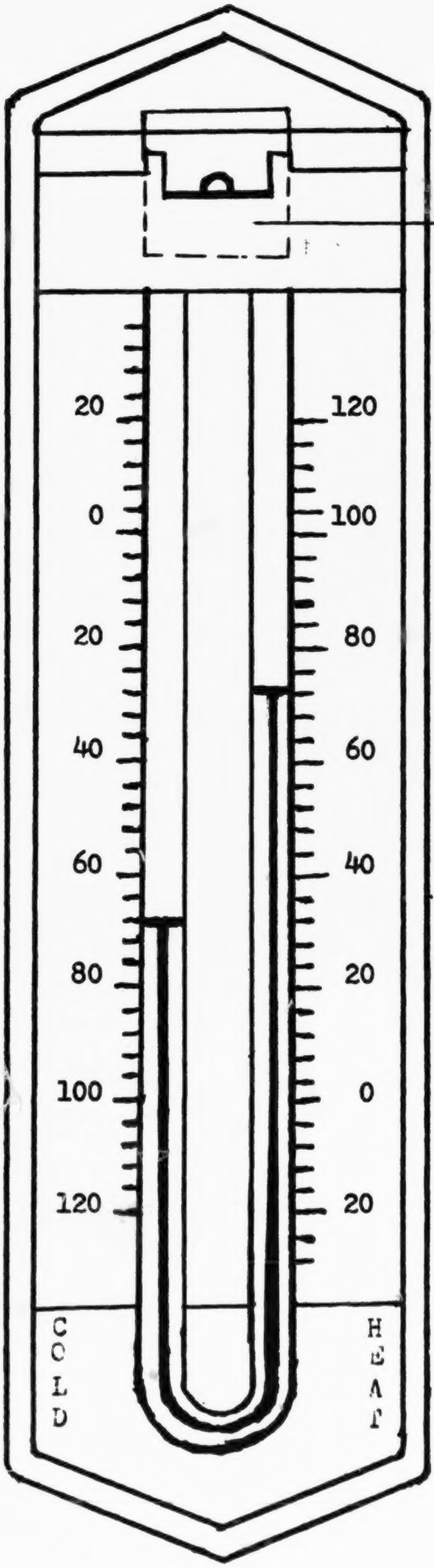


The thermometer measures how warm or cold the air is at any particular time.

Heat and cold cause the mercury or alcohol in the glass column to swell or shrink. When it is hot the mercury swells until it reaches its limit. We can read on the scale then what the temperature is.

On the Fahrenheit scale the freezing point of water is at 32 degrees above zero. Cold shrinks the mercury so that it goes down in the column when it is cold.

MAXIMUM-MINIMUM THERMOMETER



Pocket for ceramic magnet

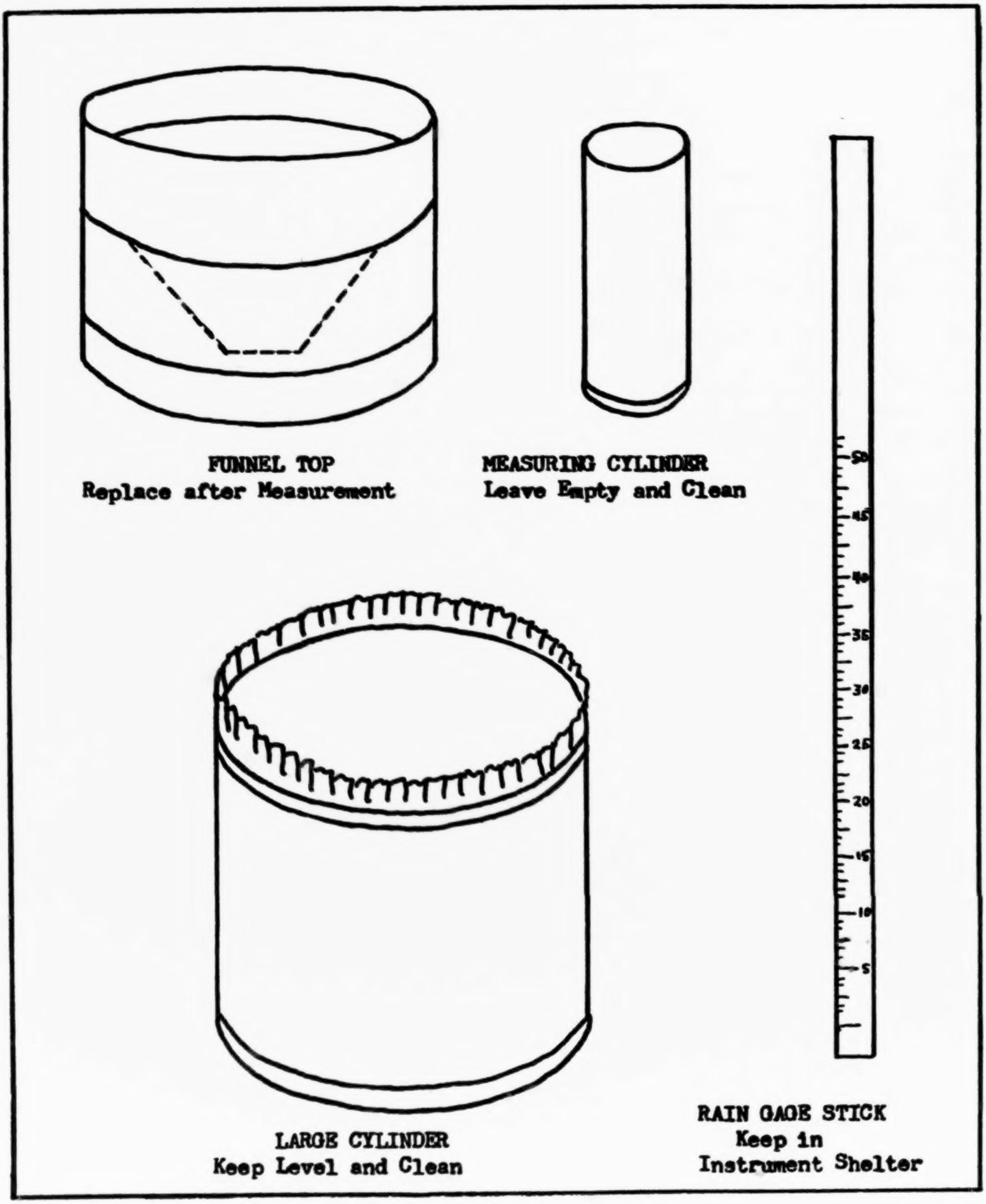
This thermometer can tell the hottest (highest) and the coldest (lowest) temperatures of the air over a longer period of time. At night when it gets cold, the column of mercury moves up on the left side, pushing a little marker along inside the glass tube. This column measures how cold it is so we call it the minimum or lowest point reached.

In the daytime when the air is warmer, the column of mercury moves up on the right side and causes the marker to be pushed up in the glass tube. This column measures how warm it gets so we call it the maximum thermometer since it measures the maximum or highest point reached.

As the mercury moves down in the minimum column the marker stays in place marking the lowest point reached. In the same way, the marker in the maximum thermometer stays put at the highest point to show how hot it was at the hottest time during the period.

To reset, place the ceramic magnet across the U-tube in horizontal position. Draw downward slowly until the indices come to rest gently on the tops of the mercury columns. The special ceramic magnet is kept in the pocket at the top of the thermometer.

FOREST SERVICE RAIN GAUGE


FUNNEL TOP
Replace after Measurement
MEASURING CYLINDER
Leave Empty and Clean
LARGE CYLINDER
Keep Level and Clean
RAIN GAGE STICK
Keep in
Instrument Shelter
50
45
40
35
30
25
20
15
10
5

RAIN GAUGE

The rain gauge measures the amount of precipitation that falls in a given amount of time. Precipitation means any moisture that falls through the air, such as rain, sleet, hail or snow.

To measure precipitation:

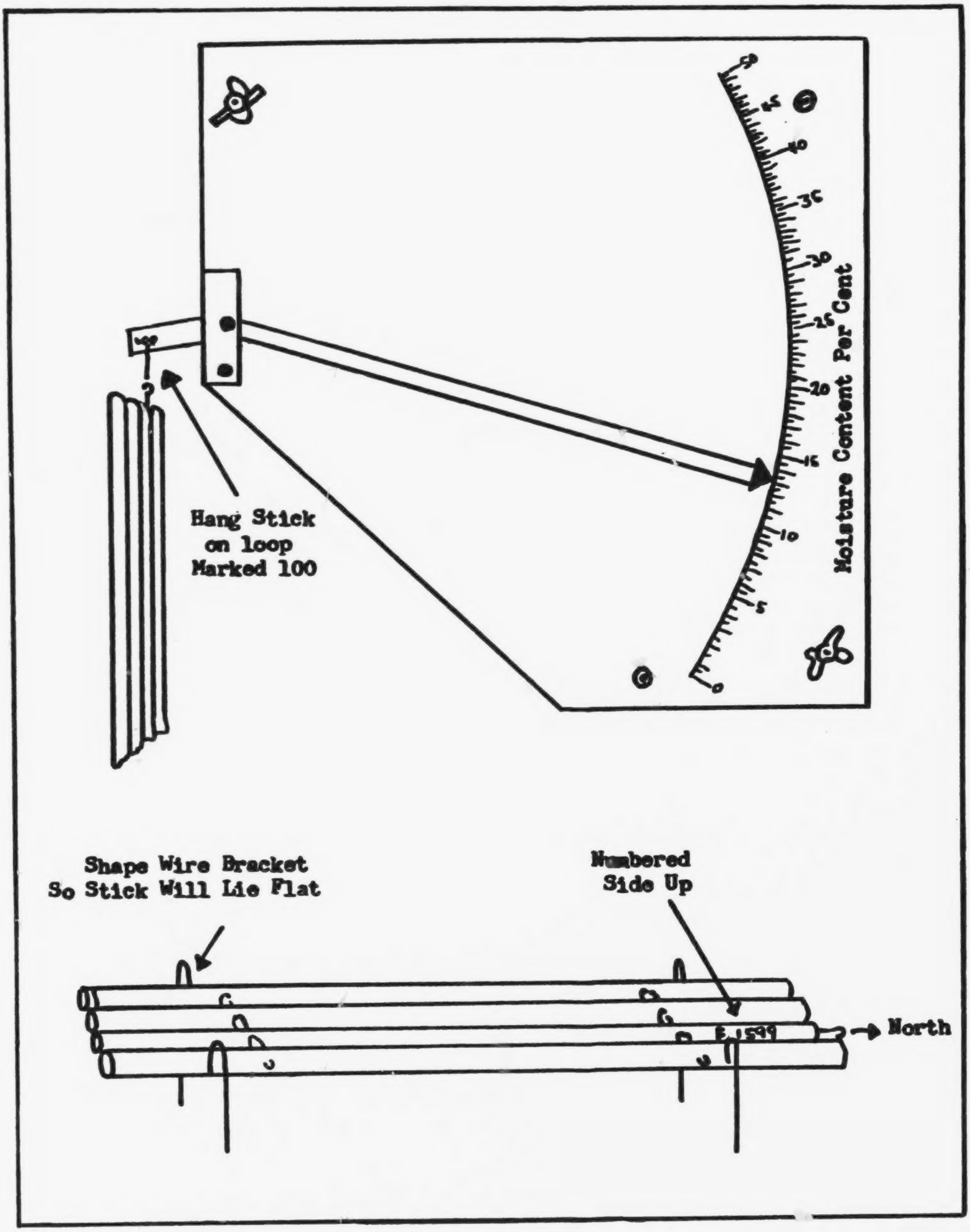
Carefully remove the funnel top from the rain gauge. A measuring stick is provided with each gauge. SLOWLY insert the dry stick into the measuring cylinder, being careful to keep the stick straight up and down. Withdraw it and read the stick at the height the water came and enter according to instructions on the Weather Record.

Do not wipe the stick with your hands. Empty the measuring cylinder and replace the funnel top.

If the rain more than fills the small cylinder and has overflowed into the large one, measure the water in the small cylinder, pour it out. Pour the water in the large cylinder into the smaller one and measure. Add the measurements together and enter the total figure on the Weather Record.

If precipitation is in the form of snow, hail, or sleet, remove the funnel top and small measuring cylinder as soon as it begins. At the usual time for observations warm the rain gauge very slightly but not enough to cause evaporation, and pour the water into the small cylinder. Measure it and enter on the Weather Record.

FUEL MOISTURE INDICATOR STICK AND SCALE


50
45
40
35
30
25
20
15
10
5
0
Moisture Content Per Cent
100
Hang Stick on loop Marked 100
Shape Wire Bracket So Stick Will Lie Flat
Numbered Side Up
E 1599
North

FUEL MOISTURE INDICATOR STICKS AND SCALE

Fuel moisture sticks measure the amount of moisture in the ground covering. This material made of pine needles, pine cones, dry leaves, twigs, and other forest material is called duff. The sticks set about a foot above this duff will hold about the same amount of water as the ground.

Because water soaked material weighs heavier than dry material, these sticks are weighed on a special scale which tells us the percent of moisture in the duff. This tells us our fire danger in our forests. If the fuel moisture scale records that the sticks weigh more than 10 grams, the fire danger is lessened accordingly. If on our scale the sticks weigh below 10 grams, our fire danger in our forest is very great.

To check the indicator scale

Before each morning reading hang the small weight found in the instrument shelter on the wire loop marked 100. If the pointer moves to zero percent and remains there the scales are level.

If the pointer does not go to zero percent, loosen the wing nuts that hold the brass scale plate to the supports and turn the plate around the upper right hand bolt until the pointer indicates zero. Tighten the wing nuts and check to see that the indicator is still at zero.

To measure stick moisture content

Be sure your hands are clean and dry or use tissue paper to pick up the fuel moisture stick from its wire supports. Handle it carefully.

Look at the stick. If it is splattered with mud be sure the mud is dry, then brush it off being careful not to rub the dirt into the stick. Shake off any surface water that may have collected due to rain. If the stick is checked, split, covered with oil, paint or otherwise damaged do not use it. Ask for a new one.

Hang the stick on the fuel moisture indicator stick scale on the wire loop marked 100. Be sure it does dot rub or rest against the shelter floor. Tap the pointer lightly to make sure that it swings freely. When it stops moving note the reading and enter it on the Weather Record.

Replace the stick on the wire supports with the numbered side up and the hook end pointing north.

ANEMOMETER

The anemometer measures the speed of the wind. The wind causes these cups to move around like a propeller. A strong wind causes the cups to rotate rapidly. When the air is calm, the cups do not move.

The cups are connected by electric wires to a switch and a buzzer which operates by batteries. Every time the cups turn around a certain number of times the buzzer buzzes if the switch is on. The faster the cups rotate the more often the buzzer will buzz. If you count the number of buzzes you hear for two minutes you can tell by reading a chart just how many miles an hour the wind is moving.

To measure wind velocity

You will need your watch. Switch on the buzzer or other signal device. Start timing at the first signal and count the next signal as number one. For two or more whole minutes count the number of signals: buzz sounds, or double clicks, if you are using the R-5 Model A wind recorder.

Divide the number of signals by the number of minutes you have been counting, (the more minutes the better results). At low velocities this will give you the indicated wind velocity only. This is corrected to actual wind velocity according to the type of anemometer you are using. See table above the picture.

Enter actual corrected wind velocity according to instructions on the back of the Fire Weather Record.

If no wind measuring instruments are available or if they are out of order you may be requested to estimate wind velocities. **DO NOT RECORD THEM BUT ENTER X** on the Fire Weather Record instead.

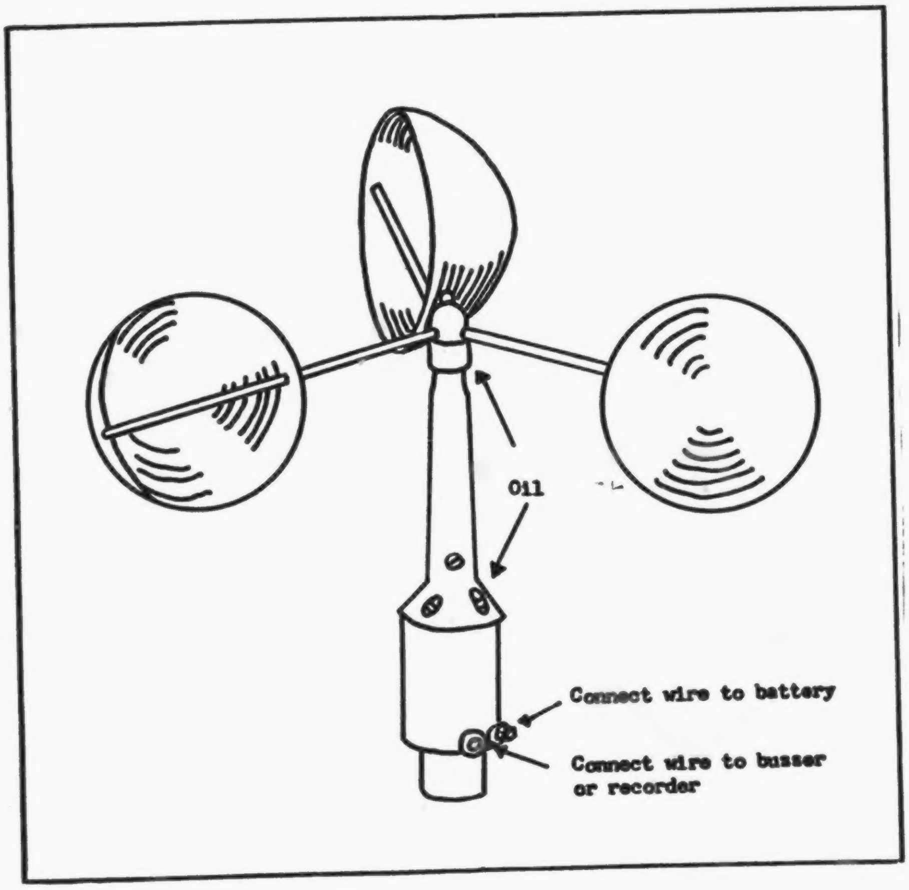
THE WIND VANE

The wind vane tells the direction that the wind is coming from. It is marked with the four points of the compass with North pointing toward true north.

Without a wind vane watch a flag, chimney smoke, trees or grass for a moment. Throw a little dust in the air to make a weather vane out of a shingle. These are ways you can decide FROM what direction the wind is blowing. Enter according to instructions on the back of the Fire Weather Record.

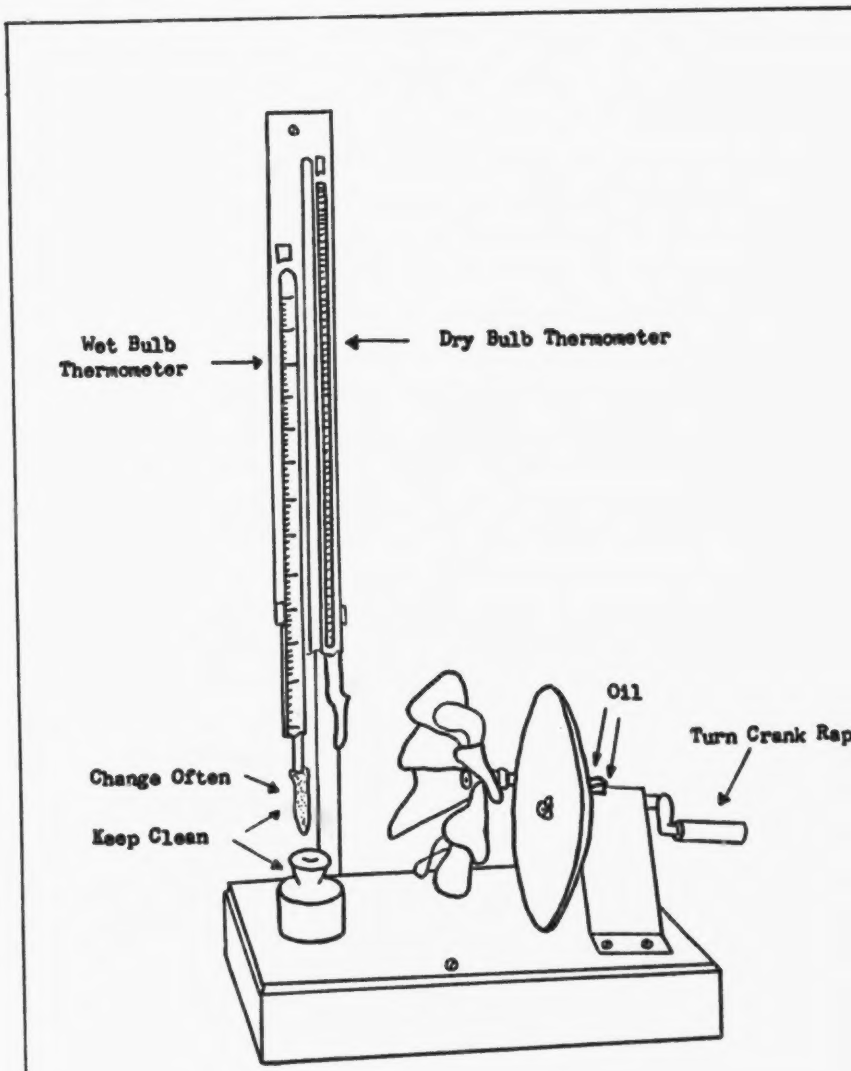
Table for Correcting Indicated Velocity to Actual Velocity

ANEMOMETER	INDICATED VELOCITY	CORRECTION
Dozier 3-cup	1 to 4 M.P.H.	Add 1 M.P.H. to Indicated Velocity
Stewart 4-cup	1 to 9 M.P.H.	
Friez 3-cup	1 to 16 M.P.H.	


Oil
Connect wire to battery
Connect wire to buzzer or recorder

ANEMOMETER

FAN PSYCHROMETER


Wet Bulb Thermometer
Dry Bulb Thermometer
Oil
Turn Crank Rap
Change Often
Keep Clean

PSYCHROMETER

The psychrometer measures how damp or how dry the air is. It has two thermometers. One of them is just like any thermometer and measures the temperature.

The other thermometer has a sleeve of cloth on one end which is dipped in water to make it wet, it becomes cooler just as your finger does when it becomes wet. Your finger feels cooler as wind blows upon it or as you swing it through the air. This is because the water is evaporating and evaporation cools things. The faster water evaporates on something, the cooler it becomes. Water evaporates faster in dry air than in damp air.

If the wet thermometer is much colder than the dry thermometer is, it means that the air is dry.

If there is not much difference between the wet thermometer and the dry thermometer, it means that there is little evaporation because the air is damp.

The difference between the temperature of the wet bulb and the dry bulb tells just how damp or dry the air is.

To read wet and dry bulb temperatures

Check the wet bulb thermometer. Is the muslin wick at least ½ inch longer than the bulb and not stretched so that the bulb shows through the meshes? Is it clean and free of scale? Is the water in the glass container clean? If not, make changes necessary to bring up to standard.

Raise the glass container, dipping the wick on the wet bulb thermometer in the water and holding it there until the wick is thoroughly wet. Crank the fan RAPIDLY, at the same time watching the mercury in the thermometer. It will fall slowly. Continue to crank for a few seconds after the mercury has reached its lowest point. Read and enter on the Fire Weather Record.

Read the dry bulb thermometer and enter the reading.

To find relative humidity

Note the elevation you entered at the top of your Weather Record. Does it correspond to the elevation given on the Relative Humidity Table? If not, exchange it for the correct one. Study the instructions on HOW TO USE THE TABLE. Using the wet and dry temperatures you have obtained, read the relative humidity from the table and enter it on the Weather Record.

EXPERIENCES IN ASTRONOMY

Point of View

The stars in the heavens have always excited the imagination of man. Ever since the time he looked up from a world of darkness to see a sky filled with specks of light he has wondered about them.

He has sensed a mystic relationship with them. Perhaps it is because he shares with them an ultimate common heritage and genesis of cosmic stuff that he feels this bond. Certainly he has become increasingly aware of his dependence upon heavenly bodies for life itself. He has observed the many ways in which he is controlled day and night by the constant movement and change in relationships among heavenly bodies.

A part of man's interest in the heavens stems from his basic need to find security by orientating himself to his surroundings. He has developed many strange concepts of his relationships in order to answer the questions:

- Who am I?
- What am I?
- Where am I?
- Where have I come from?
- Where am I going?
- Why am I here? What is the purpose for the existence of the world and life as we know it?

These are not superficial, academic questions. These are basic questions, spiritual and fundamental.

The high mountains lift children above the thick dulling screen of the lower atmosphere to the clear thin air of high places. The heavenly bodies sharpen in focus and seem to come closer until they fill the night. The star-studded night presents a setting that is ageless and infinite. It offers no answers; only questions.

In this setting, the student instinctively responds and relates in ways that he cannot comprehend.

In this setting, the teacher can lead the student to widen his wonder and deepen his appreciations. The teacher can use this back drop to help the student find himself.

Overview

Experiences in astronomy are presented in the following activities:

- Studying the stars and other heavenly bodies.
    - Observing with telescopes.
    - Hiking at night to view the heavens.
    - Identifying and locating constellations.
    - Learning legends about constellations.
    - Learning to use stars to determine direction.

- Studying telescopes; their structure, function and uses.
- Studying sun spots projected by telescopes.
- Studying light and its spectra.
- Studying the relationships of heavenly bodies.
- Visiting an observatory or museum.
- Viewing films about astronomy.

Expected Outcomes

The general benefits that can be expected from astronomy experiences are that the student:

- Becomes aware of the nearness of the heavens which are filled with bodies so far away.
- Appreciates the timelessness of the stars.
- Becomes aware that concepts of the immensity of space are incomprehensible.
- Senses a relationship with cosmic forces and substance.
- Gains a spiritual feeling about the exquisite order of all that is about him.
- Wonders about new concepts.
- Gains information that raises new questions in his mind.

Materials

- Telescopes 1 - Questar
    - ¼" reflecting with clock motor
    - ¼" refracting
    - Other smaller telescopes
- 12 Binoculars 7 x 35
- Planetariums
    - "Trippensee"
    - "Spitz Jr."
    - Pocket illuminated "star finder"
- Model of Palomar telescope
- Models of earth, moon, and sun
- Prisms
- Spectrum box
- Sky maps
- Magnifying glasses
- Sun dial
- Theodolite
- Smoke chamber and source of light (projector)
- Mirrors
- Lenses

Activities

There are so many different astronomy activities that it would be impractical to present all of them in one week. The selection of specific activities to be offered will depend upon the following factors:

-**Weather**:

When the weather is inclement, indoor activities will replace the usual outdoor activities. Some of the indoor activities to be carried on during bad weather are:

- -Viewing films - "The Story of Palomar"
- -Viewing slides - "A Trip into Space"
- -Using the "Trippensee" planetarium to demonstrate such relationships among earth, moon and sun as causes of:

    .Night and day
    .Tides
    .Seasons
    .Eclipses

- -Using the "Spitz Jr." planetarium to project constellations on ceiling for study and discussion of legends.
- -Using models of globes of earth, moon and sun to demonstrate spatial relationships.
- -Using telescopes and models of telescopes to demonstrate how they function.

    .Refracting
    .Reflecting

- -Given a detailed description of structure and function of the Hale telescope at Palomar.
- -Using prisms and spectrum box to project spectra for study.
- -Using smoke chamber to discover some of the characteristics and behavior of light.
- -Using mirrors and lenses to learn how light travels.

-**Condition of the atmosphere**:

When the sky is overcast, the activities to be selected would be the same as those for inclement weather.

-**Presence or absence of heavenly bodies**:

When the moon is shining, it affords a very interesting sight to study. Unfortunately, the light from the moon often dims the light from the stars or planets. At such times, activities depending upon good viewing conditions should be supplanted by study of the moon.

-**Time of the day**:

Many astronomy activities are suitable for presentation in the day time. In addition to those mentioned for study in bad weather, the following are also suitable:

- -Projecting sun spots with telescope and screen.
- -Observing light rays with magnifying glasses.
- -Studying earth-sun relationships by telling time with a sun dial.

-Using the sun and watch to tell direction.
-During daylight saving time it is usually too light to study the stars immediately after supper.
-Using prisms to project spectra for study.

The moon should not be overlooked at this time since it can be viewed profitably in half light.

-Length of the teaching period:

The kind of activity should be suited to the length of time available for presenting the activity.

Procedures for studying stars on a clear night

Go outside:

Take the children outside where they can feel surrounded by the heavens.

Prepare children for exploring:

Check to see that all children are warmly dressed. Supplement their clothing with panchos or rain coats. Rain gear serves well as wind breakers.

When children are properly clothed, they should be encouraged to find a very quiet place where they can feel themselves to be a part of the universe they see above and around them.

Do not stay too long in one place. Keep the students moving from time to time to promote blood circulation in cold weather. Be prepared to take group indoors before they become too chilled.

Promote observation:

Gather the students together for discussion and leading questions:

-"What do you see when you look carefully into the heavens above?"
-"Do the stars seem to be closer to us now than they do in San Diego?"
-"Is this because we are closer to them on this mountain top?" (No--We are above the thickest part of our atmosphere and so do not have to penetrate as much of our own planet's air to see the stars.)
-"Do all of the stars appear to be the same?"
-"In what ways are the things you see different?"
  Some are brighter than others.
  Some are different in color.
  Some twinkle, others do not.
  Some seem to be arranged in different patterns.
  Some are moving through the sky right now (satellites, planes).

Stimulate questioning and problem-solving:

Ask "What causes the stars to be different in each of the ways mentioned?" Briefly discuss possible explanations put forth by students.

Ask "Where are we?" by using such questions as:

-"Are all of the stars above us?"
-"Are they all around us?"
-"Are we in the center of the universe?"
-"Where are we in relation to the:

satellites
moon
meteorites
planets
sun
stars
milky way
galaxies

-"Could there be a super galaxy composed of all the galaxies we know about and others?"
-"Is there any end to it all? Does space go on for ever and ever?"
-"Can you imagine a universe without any limits?"
-"Can you imagine a universe that is bounded by limits?"

Ask "How do we learn about stars?"

-"Would you believe me if I told you that some of the stars you see are not there at all? How could this be?"
(The stars may have ceased being millions or trillions of years ago, but the light they gave off then still continues to travel toward us.)
-"Can we actually see any of the stars that we are looking at?"
"What do we see?"
"How are we able to learn about the stars?"
(Chiefly through the light that we receive from them [spectrum].)

Discuss briefly the nature and speed of light (Light year).

Ask "How would the earth look?"

-"How do you think the planet earth would appear when viewed from one of the other planets in our solar system?"
-"How would it look when viewed from one of the stars?" (We wouldn't be able to see it.)

Ask "Is there any other life?"

-"Do you suppose there could be any life on any heavenly body?"

"On the stars?" Why not?
"What kind of heavenly body would be most likely to support life?" (One with some of the characteristics of a planet.)
"Would we be able to see such a heavenly body?"

Locate and identify the patterns (constellations) in the sky.

The introductory experiences for star study on a clear night might well lead to a study of constellations. To introduce this study:

-Use a flashlight projection box to show constellation patterns.
-Use binoculars to view selected heavenly bodies.
-Discuss the historical background of man's interest in the constellations.
-Tell the legend behind certain of the constellations that are visible.
-Note special identifying features of the stars that go to make up the constellations.

Use telescopes to view heavenly bodies.

The introductory procedure preceding the constellation study can also serve as a part of a telescope viewing activity.

Be prepared: It is important that the telescopes be set up ready for use before the activity.

Plan for wide and continuous participation, since one of the problems confronted in conducting a telescope viewing activity is that relatively few students can be using the instruments at a time. Supplement the supply of telescopes with several pairs of binoculars. This provides opportunities to compare different magnifications. Encourage the students without instruments to be gainfully employed in viewing with the naked eye for specific purposes. No student should be standing around just waiting for a turn to look through the telescope.

Read background information, suggestions for operating and viewing with the telescopes in the following reference books from the camp library:

How to Use Your Telescope - Edmund Scientific Co.

Questar - Instructional Manual. New Handbook of the Heavens. Bernard Beimelt, Rice.

EXPERIENCES IN GEOLOGY

The outdoor environment at camp is particularly well suited to the study of elementary geology.

The forces which have shaped the topography of the camp environment have created many interesting geological stories to be read and studied. Some of the geological phenomena that are well suited for study in the outdoor education program are:

- The topography of the land.
- Rocks and minerals found in the local area.
- Road cuts or cliffs that expose sub-surface formations.
- Soil profiles.
- Evidences of erosion.
- Mines in the local area.

The experiences of students in the field of geology involve field experiences, laboratory experiences and work experiences. Included in the experiences in geology at camp are:

- Studying the geological history of the natural environment of the mountain area.
    - Examining road cuts, physical features, kinds of rocks.
    - Developing an exhibit of local rocks and telling the story of their origin.
- Studying soil profiles.
    - Discussing how the soil has been formed.
- Learning about mineral resources of the mountain area.
- Visiting nearby mines.
    - Collecting scheelite or gold bearing ore for study.
    - Panning the ore.
    - Observing the ore under the "Mineralite" to study flourescence.
- Viewing motion picture and still films.
- Listening to resource speakers.
- Using Geiger counters to study radioactivity.
- Identifying and labeling rocks and minerals.
- Observing topographical features of the land.
    - Mountains, valleys, ridges, divides, mesas, buttes, terraces, cliffs, gorges.
    - Discussing formation, function, effect and characteristics of land forms.
- Studying problems of the land.
- Working to control erosion of the soil.

Studying Exposed Banks

Exposed cuts, banks or cliffs can provide a vertical picture of the geological history and activity that may cover millions of years. Such cuts offer clues and evidence that can tell interesting stories to the camper with a little curiosity and detective work.

EXPOSED BANKS FIELD STUDY

En route to major activities are many exposed banks. The students hike or are driven to one of the cuts that has been selected for a special story that can be read in it. Techniques of problem solving and detecting by observing clues are encouraged.

The expected outcomes of the study are that the student:

-Gains a continuing interest in observing road cuts and banks.
-Gains experience in using methods of the scientist.
-Learns to search for and make use of clues and evidence.
-Develops an inquiring mind about his environment.

Materials:

-Geiger Counters
-Specimen bags
-Magnifying glass
-Geologists hammer
-Pencils and notebooks

Procedures:

Outline procedures for crossing roads safely. Check to see that the exposed cut can be studied safely. Establish necessary safeguards.

Group the students around the bank so that all can see easily. Direct such thought-provoking questions as:

-"Do you see what you look at?"
-"If we all looked at the same thing would we all see the same thing?"
-"Let's look at this road cut. Look at it carefully. Study it and then let's see what we see."

Give time for study. Encourage individuals to discover and contribute.

-"Now, who thinks he sees something? Jimmy, what do you see? Joe?, Helen? . . ."

Make use of discussion techniques outlined for "Sharing" and the "Last Campfire."

- "What does this bank tell us about how this place was formed?"
  (Jimmy sees a vein of quartz in granite rock.)
- "How do you suppose this vein was formed?"
  (Probably a fracture with resultant crack filled with quartz deposited from percolation.)
- "The vein seems to step up over here. There seems to be a break that runs up and down the rock."

Using the problem-solving approach, encourage students to search for faults and other evidence of diastrophism and help them to reconstruct the geologic story.

Give the students time to make observations, ask questions and then rephrase comments into questions that involve others in the discussion.

Resist the temptation to lecture!

Jackie, observing decomposing granite, may ask, "Why is this granite softer than this over here?" Lead Jackie to answer his own question. "What do you suppose has happened?" "How could it possible become softer?" "Do you find any of the granite that has crumbled?"

Examine the crumbled rock, ask

- "What are the minerals of granite?"
- "What minerals do you find remaining? Which of the minerals has softened?"
- "Yes, the feldspar has decomposed."

Discuss the importance of feldspar as the main source of clay.

- "Since we have decided that this rock is chiefly granite, what does this tell us about how this place was formed?"
- "These mountains, Palomar, Volcano, Cuyamaca and Lagunas have all been formed by great pressures and forces from deep down within the earth. Hot melted rock attempted to escape as a volcano but succeeded only in raising and bulging the top layers of rock high into the air as mountains."
- "If the hot melted rock had succeeded in breaking through the crust there would be evidences of lava flows, pumice and ash. Since the melted rock was trapped under the surface, it cooled slowly into granite."
- "When we get back to camp I will tell you the story about how rocks crystallize."

If anyone finds any metamorphic rock, develop the story of how it came to be. Help the students visualize the ancient ocean floor that once covered the region before the mountains were formed. Lead them to understand how the sands became quartzite and the mud changed from shale to schist. Explain that there could be none of the scheelite ore without first having the original lime from the ocean floor.

Check the area with the Geiger Counter for differences in background counts. Collect specimens to take back to the camp laboratory for study.

Urge students to make notes in their notebooks.

Studying a Soil Profile

Some of the best examples of soil profiles in San Diego County are to be found in the road cuts and exposed banks near the school camps.

The expected outcomes will be similar to those listed in studying exposed banks. In addition students will gain an understanding of the forces at work in manufacturing soil.

SOIL PROFILE FIELD STUDY

Materials

-See "Studying Exposed Banks."

Procedures

Safety procedures, techniques and approach are similar to those used in studying exposed banks.

Using problem-solving, question and answer approach, guide campers in observing the road-cut very carefully. Ask, "What do you see, etc."

Accept the comments and use them to stimulate further interest.

- "You are now looking at a 'factory' that is producing something very valuable even as we are watching."
- "What kind of a factory are we looking at and what is it producing?"

Use questions that lead to further creative thinking in developing the concept of the cut as a cross section of a soil-making machine.

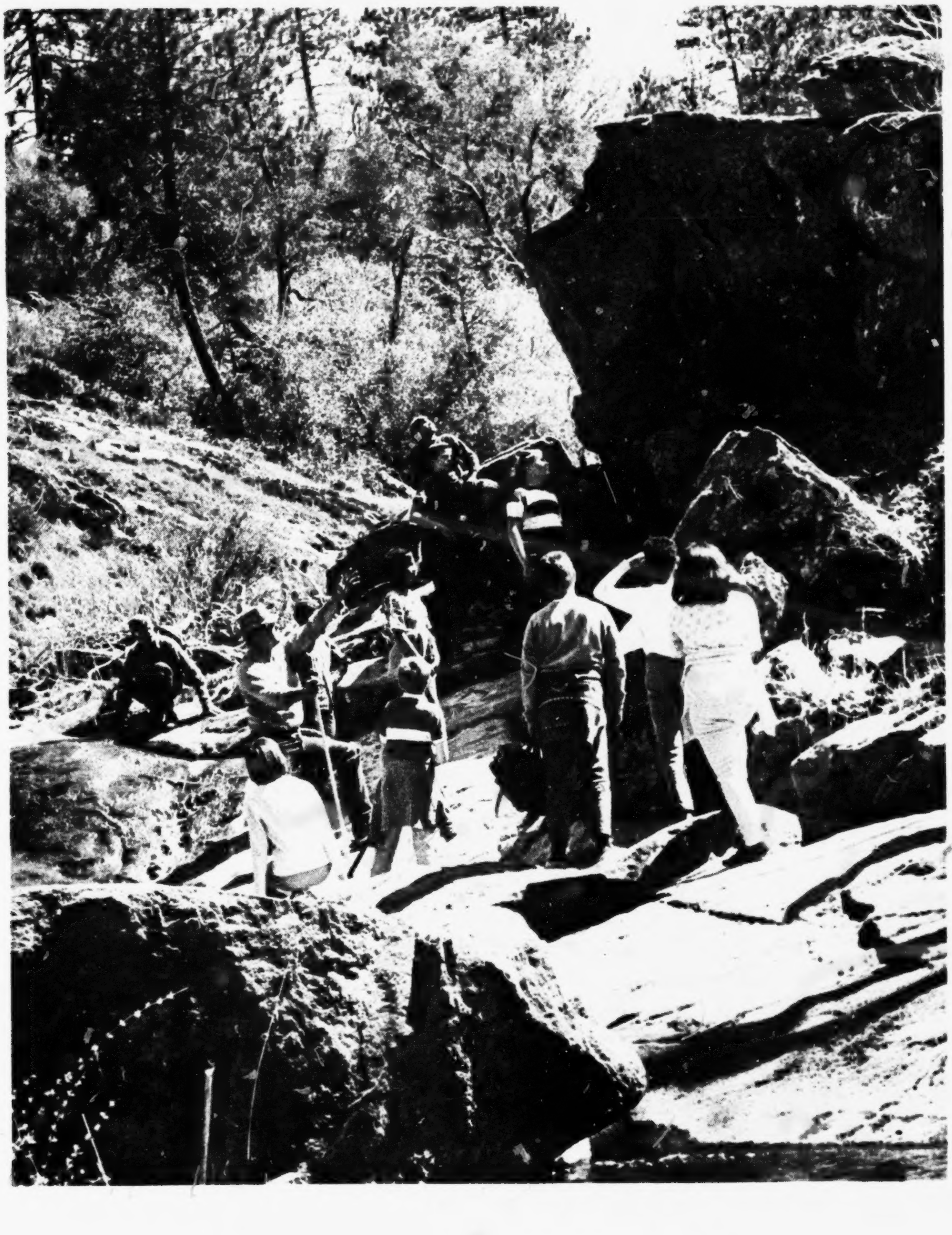
Help the students discover the following structure and function of the soil machine:

- The bedrock underlies the upper layers of subsoil and topsoil. The bedrock supplies the basic rock material for the soil.
- The subsoil is the rock layer above bedrock that is being broken up by the action of:
  - Freezing and contraction.
  - Deep roots growing, enlarging and causing new cracks for further action.
  - Water and acids that soften the rocks (particularly the feldspar in granites).
- The topsoil is the layer in which the vegetation of the surface plants mixes with the rock particles of the subsoil.
  - This layer is blanketed with a layer of humus which speeds the action of decomposition.

-The topsoil is enriched and further mixed by the action of:

- shallow roots of plants that break up, soften and add vegetable matter and moisture to the soil.
- rodents burrowing into the soil, mixing the soil with vegetation, air and water.
- insects decomposing and decaying vegetable matter and helping to further cultivate the soil.
- fungi changing nutrients of decaying plants into a form readily usable in soil.

Help the students discover the interrelationships of rock, plants and animals in the manufacture of soil which is absolutely necessary for the continued existence of living creatures.



Reading Stories in Rocks

Our world is a world of rock. The very planet we live on is composed of rock. All plants and animals are entirely dependent upon rock for life itself.

In the mountain environment of the school camps, the importance and nature of rock becomes evident in the:

- -Mountains of igneous rock.
- -Remains of old sedimentary ocean floors.
- -Evidence of rocks that have been metamorphosed (changed) from their original form.
- -Soil that has been formed from decomposed rock.
- -Rocks that are storing treasured minerals.

The study of rocks in the outdoor education program is done in the following activities:

- -Examining exposed banks and road cuts.
- -Visiting mines.
- -Hiking in areas where interesting rock formations can be observed.
- -Collecting rocks.
- -Identifying and experimenting with rocks and soil in the laboratory.

The expected outcomes of the study are that the student:

- -Gains new appreciations and interests in a part of his environment that is often overlooked or taken for granted.
- -Gains new awareness and respect for the importance of rock in his life.
- -Learns that rocks can tell the geological history of a place.

STUDY OF ROCKS

Materials

- -Geologists' hammer
- -Specimen bag
- -Geiger Counter
- -Radioactive ore
- -Magnifying glass
- -Mineralite
- -Box of representative rock specimens
- -Chart of rock classification

Procedures

The following procedures are suitable for the study of rocks in either inclement weather (indoor activities) or fair weather (outdoor activities).

Develop an interest in rocks:

-"You have chosen to study about rocks today. Why?"
-"What is your interest in rocks?"
-"What do you know about rocks?"
-"What is a rock?"
-"How is it different from a mineral?"
-"What things can you see in this room that owe their existence to rocks?"

watches
eye glasses
jewelry
pens and pencils
knives
tools
any metal
belt buckles

As a matter of fact, almost every item that the students suggest can be traced ultimately to a dependency on rock.

All animal and plant products depend upon rock in the form of soil. "What are some things that rocks can tell us?"

Use rocks as history books:

-"Can rocks tell us about the geological history of a place?"
-"Do you suppose that we could learn about how this place right here at camp was formed just by looking at the rocks that are lying outside on the gound?"
-"Shall we see what good historians we are?"

Select about six boys and girls to go outside to collect specimens from the ground. Allow about two minutes for collecting. Check to see that they are dressed appropriately for the weather. When the collectors return, have them place all of the specimens in a central place.

Open the box of sample rocks that are representative of the mountain area. Examine each of the rocks that have just been collected and match it against the known samples. It is probable that the freshly gathered collection will include such rocks as:

granite
quartz
pegmatite
schist
gneiss
clay
sandstone
quartzite

Divide the rocks into three groups: igneous, sedimentary, metamorphic. Display the rock classification chart.

-"Now, let's see just what these rocks tell us."
-"Do any of them tell us that these mountains were formed from rock that was once molten? Which ones?"

Discuss the igneous rocks.

-"Do any of them show that this place was at one time under the ocean?"

Discuss sedimentary rocks.

- "Some of the metamorphic rocks may also give evidence of ocean floor deposits." Quartzite, schist, slate.
- "Do any of the rocks show that great amounts of heat and pressure were brought to bear upon the original rock in these mountains?"

Discuss metamorphic rocks.

- "Now, after studying the rocks you have brought in today, what do you think about this area where we are? How was it formed? How did the mountains come to be?"

Discuss the following points in explaining the geological history of the area:

- The geological name of the range of mountains that includes the Laguna Mountains, the Cuyamaca Mountains, the Volcan Mountains and the Palomar Mountains is the Peninsular Range.

- The Peninsular Range was formed by the intrusion of a great mass of molten rock (magma). This magma raised the crust of the earth high but did not break through the crust. "What would we call it if the molten rock had broken through the crust?" Discuss volcanos. Use chart or model if available.

- This crust that remained on top of the molten rock acted as a blanket so that the magma cooled rather slowly.

- When molten rock cools slowly, the minerals in it try to collect together and grow into their own particular shape. If the rock cools slowly enough, the crystals will be large and well formed like this pegmatite granite. It is in such pegmatites that gem crystals are found. The great abundance of pegmatite in our San Diego mountains is a major reason why so many gems are found in the county.

- As the magma came in contact with the crust of rocks on the surface, many rocks were changed by heat and pressure to form new (metamorphic) rocks.

- "You may be interested in looking closely at rocks near your home and school. It may be that you will be able to learn something of the geological history of your backyard."

The mountains in which the camps are located provide an excellent setting for the study of rocks and minerals.

San Diego County is known throughout the state as the "Gem County." The county has a gold mining heritage. There are currently many minerals being mined throughout the county.

The study of minerals can be made in several ways. It might be carried on in conjunction with a trip to locate and collect rocks and minerals. In this case, each camper could find his own specimens to bring back to the camp laboratory where he could test the minerals for identification.

The rock and mineral study might well be carried on as an inclement weather activity. In this case, specimens could be given to campers for testing.

- -Gains increased interest and understanding about minerals.
- -Understands the need for maintaining the proper balance of minerals in his body.
- -Sees the need for adding fertilizer to soil.
- -Gains experience in scientific procedures as he conducts various tests with minerals.

STUDY OF MINERAL

Materials

- -Geologists' hammer
- -Specimen bag and newspapers
- -Supply of various minerals
- -Samples of flourescent minerals
- -Samples of radioactive minerals
- -Geiger Counters
- -"Mineralite"
- -Kit for testing hardness, (penny, knife, glass, quartz, chart of hardness scale)
- -A tile for getting the "streak" of minerals
- -Vinegar
- -Magnifying glass
- -Notebook, pencil and scotch tape
- -Egg boxes for storage
- -Samples of common mineral crystals
- -Field Guide to Rocks and Minerals
- -Magnet
- -Dishes in which minerals are growing: salt, alum, sugar, borax

Procedures

These procedures may be carried out either in the field or in the laboratory. Use the question-and-answer technique:

-What is a mineral?
-How is it different from a rock?
-What do you know about minerals?
-Have you ever seen a mineral?
-What are some of the minerals we eat in our food?
-What are some of the minerals that we have in our bodies?
-Where did they come from originally?
-Do you mean to say that the minerals in each one of us was at one time in rocks like these?
-How did the minerals get from a rock like this to our bodies?
-What happens if we do not get enough calcium in our bodies?
-What might happen if we do not get enough iron in our bodies?
-Do you suppose that we could get our iron by swallowing iron filings?
-How do plants get minerals from the rocks?
-Will some soils be richer in certain minerals than others?
-What will happen after plants have used up the minerals of soil?
-Where did the minerals in fertilizer come from?
-Are minerals ever destroyed completely or do they just change?
-Can we draw a circle showing the life story of a mineral from its birth as a part of a rock to its change into a part of soil--to some part of an animal or bird--to some part of a human being?

- All along the way dying plants and animals will be returning minerals to the soil to form new food and rocks.
- Many minerals may be carried by rain and rivers to the great reservoir of minerals, the ocean.

-If we were to take a tub of ocean water and boil the water away would there be anything left in the bottom of the tub?
-Would there be anything in addition to salt?
-Have any of you visited the salt works near Chula Vista?

- Examine minerals of salt, sugar, alum, borax, etc. that are growing in the laboratory.

-How can we recognize these minerals we have been talking about?
-What are some of the tests that will help us identify them?

- Hardness
- Shape (crystal form)
- Cleavage--(how it splits)
- Fracture--(how it breaks)
- Color
- Streak (color of the powdered material)
- Luster--glossy, metalic, greasy, dull
- Flourescence--(ultraviolet light)
- Magnetism
- Radioactivity--(Geiger Counter)
- Acidity--effervescence in vinegar, etc.

-Would you like to actually have the chance to take a piece of mineral and try to identify it by testing it?

MINERAL IDENTIFICATION TESTS

INSTRUCTIONS: Answer all the questions you are able to, by making careful tests with your mineral specimen.

I. COLOR 1. What color is your mineral? ________________

2. What other colors are present? ________________

II. TRANSPARENCY 1. Opaque - Does it block out all light? ________

2. Translucent - Does some light pass through it? __

3. Transparent - Can you see through it? ________

III. LUSTER Does your specimen look:

1. Metallic ________
2. Nonmetallic ______
3. Dull ________
4. Shiny ________
5. Greasy ____________
6. Pearly ____________
7. Glassy ____________
8. Fibrous ____________

IV. HARDNESS Will your mineral scratch:

1. Your fingernail ____
2. A copper penny ____
3. A knife blade ________
4. Glass ____________

V. WEIGHT Is your mineral heavy or light compared to other metals?

____

VI. CRYSTAL STRUCTURE

1. Can you detect any crystal structure in your specimen? ______

2. If yes, what crystal shape? ________________

VII. MAGNETIC PROPERTY Does the magnet affect your mineral? ______

VIII. STREAK TEST Does your mineral leave a streak on the tile? ______

If yes, what color? ________________

IX. FLUORESCENCE Does the ultra-violet lamp affect your mineral? ____

If yes, what color? ________________

X. RADIO - ACTIVITY Does your mineral show any radio-activity? ____

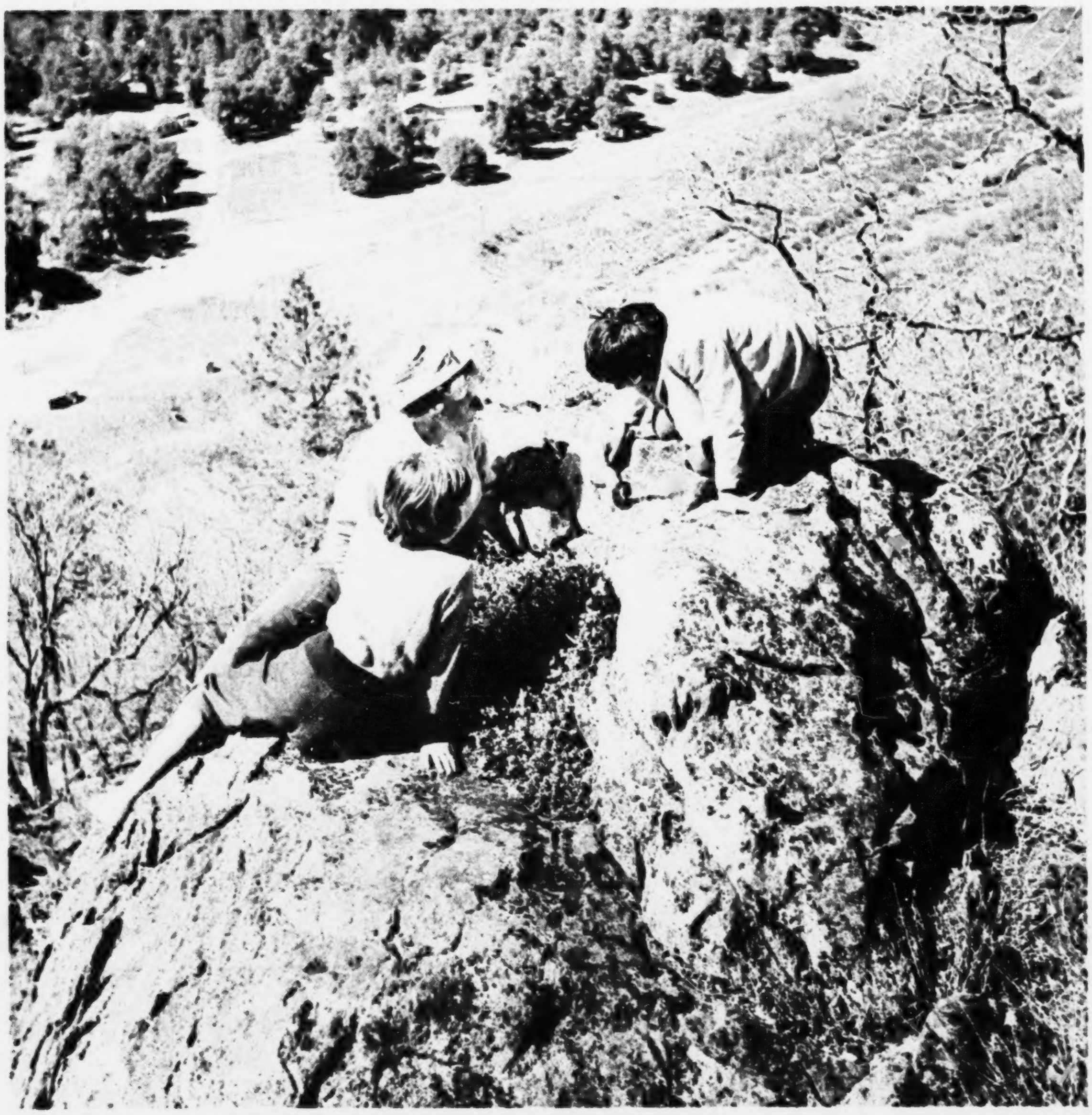
XI. CONCLUSION I believe my specimen is ________________

Let each student select a mineral and test it in the laboratory for identification. The various testing stations should be spaced about the room so that about three children can participate as a team in testing at each station simultaneously with the other groups.

It is not necessary to follow any particular order for testing. After a test is completed, each team should move clockwise to the next testing station. In this way all the campers are testing at the same time. The teachers should move from team to team to give help as necessary.

The testing period should terminate with a culmination wherein each team reports to the assembled group about the reasons for the identification they have given to their mineral.

The students should be encouraged to label and package the mineral to take back to their classroom science table.



EXPERIENCES IN GEOGRAPHY

The high mountains of the camp environment provide excellent vantage points from which the geographical effects of topography can be studied.

The study of topography and its effects in San Diego County is usually incidental and opportunistic. It can best be done as a study group reaches a high place that affords a sweeping panoramic view. It may take place during a hike or during a bus trip to an activity.

Some of the concepts and learnings that can be developed in a high level discussion include:

-Recognition and understanding of such topographic features as:

mountains
valleys
ridges

mesas
rivers
oceans
islands

-Understanding of geographic influences of topographic features such as:

watersheds
erosion
filled valleys

drainage systems
rain shadow
rain cycle

-Understanding of ecological relationships associated with such areas as:

damp coastal areas
fertile valleys with food crops
chaparral covered hills
mountain meadow graze land
forested high mountains
parched deserts

There should be a conscious effort to help the students gain a visual picture of San Diego County as a whole as they look down upon it. They should be aware of the ocean, the lowlands and the gradually rising foothills to the great divide cutting across the county before it plunges down thousands of feet to the desert.

While they are seeing the county, they should be able to locate major cities, the ocean, islands and other points of interest.

MAP AND COMPASS

The use of maps and compass is a very normal and necessary activity in hiking and camping. The fundamental need to be able to keep oriented in relationship to the surrounding terrain adds interest, motivation and purpose to the study of the proper use of map and compass.

The study of map and compass is conducted:

- -On the trail as an integral function of the hiking activity.
- -Through experiences on a prepared training course.
- -As an orienteering activity.
- -Indoors as a comprehensive unit.
- -As a fire locating activity.

Studying The Map and Compass Indoors

There are times when the weather will not be suitable for outdoor activities. This provides an opportunity for a more detailed study about the use of maps and compasses. This study should be scheduled as one of the regular inclement weather activities.

The expected outcomes are that the student:

- -Increases his awareness of the importance of location, and need for being able to find direction.
- -Gains new concepts of location and direction finding.
- -Gains new skills in using the tools of location.
- -Participates in solving problems of location.

Materials

World globe
U.S.F.S. maps of Descanso or Palomar District, Cleveland National Forest (6)
Contour maps of local camp area (12)
U.S. Army Quadrangle contour maps (12)
Compasses (12)
Pencils (24)
Scratch paper sheets (24)
Rulers (12)
Notebooks (24)
Map measurer
Tape measure
U.S.F.S. fire location map
U.S.F.S. fire finder
Model of physical relief topography of local area with contour lines indicated
Altimeter
Plaster molds of bench markers
U.S.F.S. Metal location tags

Procedures

Meet with the map study group in a room with many windows or on a covered porch that permits a panoramic view of terrain outside the room.

Arrangement of students:

-Arrange tables and chairs in a horseshoe shape with the teacher in the center with his back to the open end of the horseshoe. In this way the teacher can demonstrate on the floor while all students observe.

-The students can work in pairs with one set of maps and compasses for each pair of students.

Problem solving:

Approach the activity through problem situations that stimulate the imagination and thinking of the students and motivate them to participate actively. Start with the here and now. Ask such questions as: "What direction do you think is north? Why?"

Let them point and discuss. Distribute compasses without any explanation. "Now, what direction is north?"

The compasses may be unfamiliar to the students. This is good. Let them have a chance to solve the problem of operating the compass accurately. Encourage students to explain the operation of the compass. Add any information that is needed to clarify the use of the compass.

Distribute contour maps of the local area. "Using this map, will you please find the direction to ______?" Name some prominent landmark that is out of sight of camp but is still shown on the map; e.g., Palomar Observatory, Cosmit Indian Reservation or Green Valley Falls.

Some students may have considerable background in working with maps and compass. Such questions will challenge them and give them some opportunity for practice and leadership.

Most of the students will find problems that block their progress. Their attempts to answer the question will develop a readiness for further development of the concepts and skills needed to solve the problem.

Pose such questions as: "Most of you have located (the objective). Why can't you show us where it is?" Discuss the need to locate the camp on the map as the first requisite in showing direction in relation to the camp.

Orienting the map:

Demonstrate the need to orient the map to north in order to locate direction accurately. Refer to suggestions presented in the section, "Hiking with Map and Compass."

Contour lines:

Inquire about the character of the topography between camp and the objective. "Is it level? Are there mountains or valleys?" This approach leads to a study of the contour lines. What are they? Why are they shaped as they are? Why are they sometimes close together and sometimes far apart?

Use the relief model showing the topography of the mountain area to illustrate that contour lines are lines that join all points of equal elevation.

-Illustrate by looking outside at a ridge or peak that is represented on the model and map.

-Dramatize a situation in which several of the campers are selected and sent over to the ridge in question. Imagine that each of the campers took a stick and an altimeter and climbed the ridge. Camper No. 1 would climb until his altimeter read ___ft .(use the figure designated on the contour map). Camper No. 2 would climb 40' or 50' (check the contour interval on the map). Camper No. 3 would climb ___feet high. Each of the students would scratch a line in the dirt to show the specified elevation. With great care each camper would move along the side of the ridge, always checking his altimeter and always marking a line joining those places of equal elevation.

-Explain that the lines would always keep the same difference in elevation just as these contour lines on this model always maintain a 40 (or 50) foot interval or difference.

Hold the model up so that all can see the parallel or equidistant arrangement of the contour lines. Continue the study by saying, "But, let's suppose that we were able to fly above the ridge and look down upon the lines drawn by ___ ___ ___ and ___. What would the pattern of the lines look like?"

Place the model down on the floor so that the campers can see. Point out the movement of the lines as they go along the side of the ridge and bend in whenever there is a valley or out along points of the ridge.

Ask the students to refer to their contour maps where they can see the pattern of the model shown on their flat maps. Help the students visualize mountain peaks, valleys, mesas as represented by contour lines on the map.

Scale of distance:

Refer to original objective "How far away from here is (name the objective)?" Let them estimate. Someone will probably mention the scale. Have students use rulers to measure distance between camp and the objective. Help them convert the measurement to miles by using the scale of distance.

Discuss the problem of measuring distances of hiking routes shown on the map. Demonstrate the map measurer. Show how string can be used.

The Public Land Survey:

Use the U.S.F.S. ranger district maps to illustrate the various units included in the Public Land Survey System.

Show samples of different markers used to designate section corners and specific locations in the mountains. Set up a pacing course or two to give students a chance to establish their pacing standard. (Refer to section on "Orienteering with Map and Compass.")

This activity gives the students a chance to stretch their legs even though the course must be set up indoors.

Concepts to be developed:

Some of the concepts to be developed in the map and compass study are:

- All places on earth can be located by measurements of latitude - north and south, and longitude - east and west.

- The latitude-longitude system of location is the basis for more localized systems such as the Public Land Survey.

- The Public Land Survey is a system whereby the land west of the Mississippi River is divided into a pattern of townships, ranges, and sections. This system provides a legal description for any point or parcel of land in the country.

- Even wilderness areas in the mountains can be located and found by someone who is familiar with maps, compasses and the Public Land System.

- Location markers are placed throughout the mountains to guide foresters and surveyors in locating places. Some of these markers are:

  Bench marks denoting position and elevation.
  Section corner, divisions of sections and section lines are located by metal tags, monuments (piles of rock), or blazes on trees (inscriptions).
  Markers should never be disturbed. No unnecessary blazes should ever be cut into trees.

- The pattern of townships, ranges, and sections is located in reference to some prominent geographical landmark. A principal meridian runs north and south through the reference point. Paralleling this principal meridian on either side are columns of townships. Each vertical column of townships is called a Range.

- The first column of townships is Range number 1. Ranges to the east of the principal meridian are numbered consecutively R. 1 E., R. 2 E., R. 3 E., . . . Ranges to the west are numbered R. 1 W., R. 2 W., R. 3 W., . . .

- Township lines are numbered consecutively either north or south as they move away from the base line; e.g., T 1 s, T 2 S, T 3 S or T 1 N, T 2 N, T 3 N, T 4 N, T 5 N . . .

- The reference point for the principal meridian and the base line for land in Southern California is San Bernardino Mountain.

- Each range is six miles wide; each township line is six miles apart.

- There are 36 sections in each township. The numbering pattern is always the same.

- Each section is one mile square and is subdivided in $\frac{1}{4}$ sections and 1/16 sections.

- Locations are usually made in reference to distances expressed in "chains" from section corners on $\frac{1}{4}$ section corners.

Locating fires with map and compass:

The system of fire-finding employed by the U.S. Forest Service and California Division of Forestry is both interesting and informative. Many concepts about location can be developed through the use of the fire finders and locating maps. (See "Forest Fire Protection.")

Finding direction with the sun and stars:

Interesting lessons about direction and location can be developed through the use of such devices as the watch to show direction, sun dials and shadow sticks. Principles of navigation that have been practiced for hundreds of years can be domonstrated in the following activities:

- Finding direction by the stars
- Determining latitude by using simple astrolabe to measure the angle of the pole star.
- Using watches and the world globe to determine longitude by measuring degrees and time from Greenwich Meridian.

In conclusion, it should be emphasized that information included within the legends, along the margins, and in the main body of maps should be presented in a developmental manner. It should not be presented as subject matter in a lecture approach.

Hiking with map and compass:

Hiking affords an excellent means for providing experience and instruction in the use of maps and compasses.

Pre-planning--

The principles and techniques of using maps and compasses can be demonstrated more clearly if the teaching site has been selected with care. Sites on certain hikes lend themselves especially well to experiences involving high places with panoramic vistas which include many landmarks. Some hikes include excellent opportunities for teaching concepts and skills relating to "being lost." The teacher should select his teaching sites beforehand so that:

-The hiking group will arrive at the site at the right time.
-The characteristics of the site will meet the demands of the concepts to be taught.

The teacher should see that the students have a supply of maps and compasses with them on the hike. He should try to introduce the experiences with map and compass as a natural and incidental outgrowth of the hike. Instruction should be purposeful and should be closely related to the hiking experience.

Use a problem-solving approach--

The approach to instruction about maps and compass should be a problem-solving approach in which the students are actively and pertinently involved. They should be faced with the need to solve the problem.

"Getting lost" on the hike--

One of the interesting problem situations which is rich in opportunities for teaching timely and meaningful concepts is to "become lost." It is not necessary to try to convince members of the group that they are lost. It is necessary to simulate the situation enough to bring to them an impact of feeling and appreciation of being lost. This is a good time for a little dramatic play.

In this case the site might well be a valley in which the camp and familiar landmarks are obscured from view. Ask:

-Where are we?
-Which direction is camp?
-How can we get back to camp?

Remind the hikers that they have maps of the area and compasses that will help them find direction. Find a flat, level area where the maps can be spread out so that all students can see.

Do not solve their problems for them--

Let them use their knowledge and ingenuity in developing their ideas. Their efforts will usually bring them face to face with new questions that must be answered before they can progress further. Some of the questions they will need to answer are:

- Where are we now?
- How can we show where we are on the map? What must we do first?

Check their ability to read the compass accurately. Help them see the need to orient the map by leading remarks:

- Do the directions on the map need to agree with the directions of this place where we are?
- We know that direction is north. (Point.)
- "How can we line up our map so that our north will be the same as north on the map?"

Point out the orienting "North" arrow marked on the map and explain its function. Discuss the magnetic north marker. Lay the map level on the ground next to a compass so that the arrow for magnetic north on the map points in the same direction as the magnetic needle on the compass. "Now the map is oriented but where are we on the map? Are we here? or here?"

The next step is important. It will be necessary to study the contour lines carefully in order to visualize the topography or relief of the land. It will be necessary to search for peaks, ridges, valleys, or patterns of physical features shown on the map that agree with those that can be observed in the surrounding area by the group.

If no pattern can be easily discerned, it may be necessary to climb to a vantage point for a better view of the topography. However, the teacher will usually choose a site in which the land pattern can be recognized.

It is usually necessary to give some explanation of the contour lines on the map. (Refer to section on "Studying Map and Compass Indoors") After the students have located themselves on the map, they are ready to proceed in their efforts to answer the question "How can we get back to camp?"

- "What direction is camp from here?" (Have the students indicate by pointing.)
- "What is the best route back to camp?"

Discuss the information that the map shows that will be helpful in selecting a route to camp. Look on the map for valleys, roads or streams that could be followed.

Beware of steep mountains or gorges. Give attention to differences in elevation. Check contour interval. Discuss the information that the map does not show. Discuss the problems of ground cover. Warn hikers about trying to travel through chaparral.

As the group moves along the selected route toward camp, it will be necessary to coordinate the information on the map with the actual terrain observed.

It is helpful to draw a line on the map from the known starting point to a place that can be located on the map and can also be seen as a landmark in the immediate surroundings. This landmark should not be so far away that the group's position on the map becomes uncertain. By working from landmark stations to other landmarks it is possible to work out of obscured and hidden positions to areas where there is no longer any need for orienting closely the route on the map with the observable route through the terrain.

Following a bearing course--

It is advisable to take compass readings of the course you wish to follow. The readings should be taken along the course on bearing points that are as far away from the group as possible. Sometimes a configuration on the skyline may be visible throughout most of the route. Sometimes it may be necessary to select a bearing that is but a short distance away from the hiking group. To make a bearing reading:

- Lay the compass flat and orient the needle to north. It is simpler to deal entirely with magnetic north so as not to become involved with declination of the needle.

- Sight along the face of the compass through the needle pivot to the objective.

- The reading on the far side of the dial is the bearing reading for the direction of the objective.

Following a back reading bearing course--

At times the going may become so rough that it is not possible to sight ahead to get a bearing on landmarks. In order to keep yourself on course as you detour around obstacles, it may be necessary to look backwards and take a "back degree reading" on your starting point or on a landmark near the starting point.

A "back degree reading" is the azimuth reading on the compass which is exactly opposite the bearing route you are walking toward. It is the reading on the compass of the bearing route you are traveling from.

A general rule for taking the back reading is:

- -If the "going" reading is less than 180 degrees, add 180 degrees to it. If the "going" reading is more than 180 degrees, subtract 180 degrees from it.
- -If your "going" course is 270 degrees, you should subtract 180 degrees. Your back reading is 270° - 180° or 90°.

Set your compass (orient it to north) and sight back on your starting point. If your starting point is on the 90° mark, you are on course. If not, walk to the right or left until your starting point is on the 90° reading.

As you come to places where it is possible to see landmarks with which you are familiar, you should recheck your position as indicated on the map and correct any mistakes before proceeding.

If you should not have a compass you may use a watch as a compass. If no sun is visible, you may be able to orient your map by inspecting the surrounding landmarks and lining up the map to agree with those landmarks.

Orienteering with map and compass--

Orienteering is done in many different ways. In Europe, it takes the form of a sport with well-established international rules. In this country it is often set up on a more informal basis. Essentially, it is an activity in which a prearranged compass course has been established with instructions regarding directions and distances provided at stations along the way. The participants progress from a starting point and follow diretions and distances given until they come to the next station. Such instructions might include:

- -Station #2 - 72° for 3 chains (or 198')
- -Station #3 - 122° for 4½ chains (or 297')

The use of the surveyor's unit of "chain" introduces the need to give some experience to campers in establishing their individual pace rate for one chain. This can be done by marking off the distance of one chain and by letting them count the paces required to walk the course with deliberate, measured and consistent tread.

The instructions provided at each station can be modified to include clues and directives involving natural phenomena. This sometimes adds interest and expands the area of information that can be brought into play in the activity.

The instructions at the stations might include:

- -Station #2 - 275° for 6 chains. Look for instructions under granite boulder located halfway between black oak tree and incense cedar tree.

This activity is flexible in time so as to fit into such teaching opportunities as the Indian camp activity or Friday morning activity.

FOREST FIRE PROTECTION

Forest and brush fires pose a very real and imminent danger to the people and resources of San Diego county. The threat of danger and its influence upon the lives of young people become more immediate as it is faced and dealt with in the outdoor education program.

Study of the problems and program of forest fire protection by students involved in activities in the mountain forest area is timely, meaningful, and purposeful.

Concepts and experiences included in the forest fire activity are divided into four aspects of the fire problem.

Fire Prevention - Preventing fires in the first place.
Protection - Providing safeguards to protect against ravages of any fires that do start.
Detection and location - Planning a system of detection and location of fires to control them early while they are still small.
Control and suppression - Preparing a program and organization of men and equipment for the purpose of putting out fires as quickly as possible.

The Expected Outcomes are that the student:

- Learns about the problems and program of forest fire prevention, detection and suppression.
- Gains first-hand experience in using fire detection and suppression instruments and equipment.
- Gains understanding about the nature and behavior of fire.
- Participates in solving problems related to forest fire protection.

Materials:

Compassess (engineer type) (15)
Osborne fire finders (3)
Large permanent map of adjacent areas of county (painted on concrete slab)
Field telephones (connecting observing posts with camp dispatch office) (2)
Large wall map of adjacent county area
Fireproof container in which small fires can be built and transported
Variety of fire extinguishers (water, CO^2, baking soda)
Variety of fire suppression hand tools and equipment (shovels, brush hooks, McCleods, etc.)
Chalkboard and chalk

Procedures for protection and control:

Meet in dispatcher's room to discuss the problem of forest fires in San Diego County mountains. Elicit answers to the following questions:

"How can forest fires be prevented?"

- Observing good conservation practices and forest manners. (campfires, cigarettes, trash)

-Establishing and enforcing rules and regulations. (state parks, national forests)
-Educating the public.

"How can we protect ourselves against any fires that do start?"

-Keep fuels stored properly.
-Clean weeds and brush away from incinerators and dwellings.
-Develop a system and an organization for protecting people and property from fire (U.S. Forest Service, California Division of Forestry).

"How can forest fires be detected, located and reported early enough to put them out while they are small?"

-Refer briefly to the networks of fire lookout stations scattered throughout the high mountains of the county. Do not go into detail at this time.

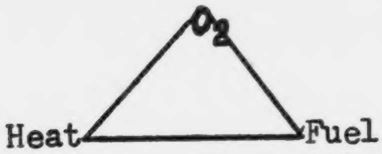
"How can forest fires be controlled and extinguished?"

-Refer briefly to the fire fighting organizations of both the California Division of Forestry and the U.S. Forest Service. Do not go into detail at this time.

Nature and behavior of fire:

Discuss the nature and behavior of fire.

"What is fire?"
"What are the basic ingredients of fire?"



"Can we have fire without oxygen? heat? fuel?

Explore the nature and behavior of fire. Take the group outside for fire activities if weather allows.

Light a candle and invert a bottle over the flame to cut off the supply of oxygen. Observe the flame dwindle and die out.

"Why did the flame die out?"
"Yes, we removed the oxygen."

Light a candle in open air.

"Does it have all the ingredients?"
"Which ingredient shall we remove this time?"
"Let's remove the fuel."

Snip off the wick from the body of the candle. Let the wick burn during the snipping process.

"What happens when we remove the fuel?"
"What ingredient should we remove this time?"
"Let's remove the heat."

Place candle upright, ready for lighting but do not light.

"What ingredients do we have now?" (air and fuel)
"Why doesn't the candle burn?" (no heat)
"In what ways can heat be provided in sufficient intensity to start fire?"

Have materials at hand so that students can experiment with various methods of providing enough heat to start a fire.

-Friction - bow and drill, etc.
-Spark - flint and steel (quartz and file) cigarette lighter.
-Solar heat - magnifying glass, reflecting cigarette lighter, bottles acting as lenses.
-Electricity - lightning and wiring.

Even though the experimentation does not result in a flash point that results in a flame, the heat that is produced is sufficient to convince the students that fire can start in many ways.

Forest fire:

Demonstrate how fire can burn down forests.

"How is it possible for a match flame to burn down large trees?"

Select a peeled log section and hold lighted match up against the side of the log.

"Why doesn't the wood burn?"

Demonstrate the effect of fuel arrangement by applying a match flame to shavings from the log, dried grass, shredded bark or weeds arranged in small piles. Select a safe place to build the fire so that the fire cannot spread. Add twigs and limbs to the fire to illustrate the principles of fuel arrangement.

"Do you see now how a match flame can burn down large trees?"

Let the fire continue to burn and help students visualize it as the beginnings of a brush or forest fire someplace out in the county.

Explore the problem of protection from fire.

"What can be done to protect forests, chaparral and people from such fires?"

"What must be done first?"

-First they must be detected. People must learn about the fire before they can take any action to put it out.

"How are firefighters able to learn quickly about fires that start in the mountains of Sounthern California?" Discuss.

-Explain about the network system of lookout stations manned by U.S.F.S. and California Division of Forestry personnel.

"How would you like to be a lookout stationed high on some mountain top?"

-Lonely 12-hour shifts, responsibility, always alert.

"Would you like to find out for yourselves just what his job is like?"

"What do we do and what must we know in order to report fires from our lookout station?"

Let the students discover the need for certain items of equipment to be used in reporting fires.

"Are we all ready for duty?"

Set up a problem situation.

"Look at that smoke away over there near that oak tree."

-Select a distant landmark that can be seen by all and pretend that smoke can be seen rising near it.

"Now that we, as lookouts, can see the smoke, what should we do?"

Discuss with the students how we might communicate with foresters to tell them about it (radio, telephone).

"What information can we tell the foresters?"

-Let students try to give pertinent and necessary information from observation.

"What information do the foresters need to know?"

-Direction of fire from lookout station.
-Approximate distance from lookout station.
-Direction of smoke drift (indicates direction of wind).
-Color of smoke (indicates type of fuel).
-Height of smoke column.

"How can we tell the direction of the fire from the lookout station?"

-Use compass to tell direction.

Distribute compasses (lensatic) to students so that they can get a bearing on the simulated smoke column. Let students attempt to get compass readings in order to promote a readiness for compass instruction. Give instruction on features and use of compass until all are able to locate the smoke. Give additional problems and exercises in locating fires near other landmarks in order to improve facility and accuracy in using the compasses.

"Wouldn't it be helpful if:

-You didn't have to hold your compass level in your hands?
-You didn't have to worry about keeping your compass oriented to north while you were taking a reading?
-You could use a much larger compass that could be read easily?"

"Fire lookouts were faced with this same problem, so someone named Osbourne developed such a compass and called it a fire finder. Would you like to see one?"

Set up an Osbourne Fire Finder in its proper lookout station position, pointing out that the tripod and base provide a level compass that is always pointing north. Explain the dial markings on the face of the finder as a compass circle. Illustrate the advantages of the sighting device.

Set up the two remaining Osbourne Fire Finders in position on the large, permanent ground map of the mountain area.

Help the students visualize the large ground map as representing a larger area of the surrounding region. Relate the lookout stations on the map to the actual stations on nearby mountain peaks.

Divide the students into teams with three or four students in each team. Let each team stand near its own lookout station. Help students understand that they actually may be 20 or 30 miles from the other teams.

"You have had experience in locating smoke off in the distance here at camp."

"Now you will close your eyes for a minute while we move from camp and climb up to your lookout station on Mt. ________. Imagine that the area represented by this map is really a large part of the San Diego mountain area."

Pose the following problem:

"Now, I am going to start a fire here in this part of the county. Will each lookout sight the fire and make a note of the asimuth reading on your fire finder?"

Give them time to make their sightings. Note that all of the azimuth readings are different.

> "How can these three readings help us to locate just where the fire is?"

Take a 20' heavy string and run it from Mt.__________ lookout along azimuth reading across the fire.

> "This sighting tells us that the fire is somewhere along this line doesn't it?"
>
> "What doesn't it tell us?"
>
> "That's right, it doesn't tell us whether it is here, or here, or here along that line." (keep the line stretched)
>
> "Now, let's take a sighting from Mt.__________ lookout.

Repeat the string procedure. Note the spot where the two strings cross.

> "Now take a sighting from Mt.__________ lookout." (The three strings should cross near the same point.)
>
> "If each of the three stations were to tell a forester the azimuth reading for his sighting on the smoke, is it possible that the forester could determine the location of the fire by using a map with lines running from the lookout stations in the direction of the azimuth readings? Where would the fire be? Yes, just where the lines crossed."
>
> "Here is a phone for use by the lookout. Will someone phone the sighting information to the forester."

Give orientation on use of phone. Speak clearly and briefly. Use code signals.

-10-4 - message has been received and understood.
-10-9 - repeat your message.
-10-20- give your location.

> "Whom are we speaking to and how is he going to use the information?"

Take group to the dispatcher's office.

Meet in the dispatchers office to learn about the function and responsibilities of the dispatcher.

Refer to the wall map of the mountain area. Show how the wall map corresponds to the ground map that was used outside.

- Locate the local lookout stations on the map.
- Show how the heavy strings stretched from the stations across the fire on the ground map outside correspond to the strings that are stretched on the wall map from the lookout station across the azimuth reading to the fire. Use the same azimuth readings that were indicated for the fire outdoors.

Present the following hypothetical problem to reinforce the concepts of locating a fire from azimuth readings:

"The lookout at Mt. _____ station reports a smoke at azimuth # _____.
"Here is the locating string for Mt. ______ station."

"In what direction shall we stretch the string?"

- Encourage students to examine the circle marked with azimuth numbers until they locate the right number.
- Draw the string across the number and extend it well across the map.

Repeat the process of stretching strings from two other reporting stations.

If the azimuth readings have previously been checked for accuracy the point at which the three strings across should locate the fire. If the three strings do not cross exactly, explain that this sometimes happens but that it still confines the location of the fire to a very small area.

Recapitulate the steps taken so far in locating a fire.

The lookout:

- Sees the fire.
- Sights the fire.
- Notes the azimuth reading for the fire.
- Reports the reading by phone to the dispatcher.

The dispatcher:

- Receives the call from the lookout.
- Makes careful notes of azimuth readings and other pertinent information.
- Locates fire on wall map by drawing strings from lookout stations across designated azimuth readings.

Discuss steps to be taken now that fire has been located. Outline briefly the following action:

The dispatcher:

- Decides which fire stations and what equipment should be directed to the fire.

-Radios or phones instructions, location and directions for getting to the fire area.
-Alerts the fire boss who will take charge of the fire fighting and will work closely with the dispatcher.

Role playing:

Organize for student role playing.

"Now that you have learned how fires are located and reported, do you think that you could do the job?"

If there are enough students to warrant two teachers for the activity, they should be divided into two groups. One teacher would set up fire location problems outdoors. The other would review dispatch procedures and discuss related activities. Both groups would receive added practice in using the phone system.

Set up the problem situations (outdoor group).

Use a lighted flare (in a container) to simulate the forest fire. Place the flare container at some point on the ground map where all three lookouts can get good sightings.

Each lookout station will be manned by three or four students. Each of the students should share in all of the experiences related to:

- Sighting the fire.
- Determining the azimuth reading.
- Reporting the fire by phone.

Try to locate the fire from information received from the lookouts.

Discuss the Public Land Survey System of ranges, townships and sections.

Each of the students should be involved in all of the experiences related to:

- Receiving the information by phone.
- Stretching strings across azimuth readings.
- Describing the location of the fire.
- Dispatching a fire crew to the scene of the fire.

Trade groups so that the lookouts become dispatchers and vice versa.

Discuss and demonstrate methods of control of fires. Review the nature of fire to gain clues about methods of control.

"What does fire need?"
"What will happen if we remove any of the three essentials?"
"How can we remove the heat?"

- Spreading fuel so that it is not concentrated.
- Cooling action of water.

"How can we remove the oxygen?"

- Smother the fire to exclude oxygen (dirt, fog, foam, blanket).
- Chemical extinguishers.

"How can we remove the fuel?"

- Place barrier between fire and fuel.
- Clear space between fire and fuel using hand tools (shovels, brush hooks, McCleods, Pulaskis, axes, etc.).

If time allows, demonstrate various techniques for suppressing fire.

Discuss ways in which the students could protect themselves from dangerous fire situations. (Refer to section on "Fire Protection.")

Store equipment and supplies.

Evaluate the activity:

- Value of prevention of fires.
- Value of protection system.
- Need for early location of fire.
- Need for good communications.
- Need for skill in use of equipment.
- Need for cool heads and wise action.

EXPERIENCES WITH PLANTS AND ANIMALS

The outdoor environment at camp includes a community of living things into which the student is introduced as a new member of the community. As a functioning member of this living community, the child is able to see at close view the interdependencies and interrelationships of living things. He is also able to participate in the web of interdependencies and interrelationships.

The student is able to see that everything he does in the natural environment affects other life. He is able to see that his own experiences are dependent upon the influences and actions of other members of the community.

Experiences with plants and animals are presented in the following activities:

- Hiking to explore.
- Conserving natural resources.
- Collecting and studying plants and animals.
- Using aquaria, terraria and vivaria in the camp museum.
- Using mounted birds and animals to illustrate animal talks.
- Observing, casting and studying animal tracks.
- Viewing camp films.
- Fishing.
- Using laboratory equipment to study specimens.
- Studying pond ecology.

The general outcomes are that the student:

- Gains understanding of his role in the web of interrelationships of living things.
- Learns the major concepts listed for plants and animals.
- Understands the need for establishing and following rules designed to improve a desirable balance in living things.
- Gains insight into the wonder of the orderly and consistent adherence and response of life to natural forces and laws.

POND ECOLOGY

The pond provides an excellent outdoor laboratory for using scientific methods and equipment in studying interrelationships and interdependencies of living things.

Ecology deals with the study of the relationships of living organisms to their environment.

The pond provides a stable environment (ecosystem) in which living and non-living things interact and in which materials are used over and over again. The natural group of plants and animals living together in the pond environment is a community.

The place where living things live is their habitat. A pond contains micro habitates within the larger pond habitat, e.g. the bottom mud or sand habitat, the surface habitat, vegetation habitats.

The pond ecology activity includes some orientation in the science room, field study at the pond and follow-up research in the science room.

The expected outcomes are that the student:

-Expands his awareness of his natural world through exploration and discovery.

-Finds a sense of serenity, inspiration and spiritual well-being as he becomes aware of the beauty and exquisite order of his natural surroundings.

-Learns through first-hand, direct experiences in real life situations.

-Does original thinking in attempting to interpret and investigate his natural world.

-Questions the things he sees - develops an inquiring mind.

-Uses the methods and approach of the scientist.

-Improves his understanding of the interrelationships and interdependencies of living things.

-Appreciates the importance of such ecosystems as ponds and streams.

Materials

magnifying glasses
microscopes
bioscopes
slides and cover glasses
spiral notebooks and pencils
reference books:
Field Books of Ponds and Steams by A. H. Morgan.

methyl cellulose
eye dropper and tweezers
dip nets for collecting
collecting containers
underwater viewing devices
thermometer

Procedures in the Science Room

Motivating the group to explore and learn about the pond:

Ask thought-provoking questions.

-"What is a pond?"
-"How is it important? To whom?"

Do not go into detail or attempt to teach information at this time. Save any discussion or viewing of charts until after the students have returned from exploring the pond.

Planning a method of investigation:

Approach the method of learning about the pond by saying, "You have indicated an interest in learning about the pond and the things that live in it. Let's all think together for a moment. How can we best learn about the pond?"

The discussion will usually lead to the following recommendations:

-Go to the pond.
-Explore it without disturbing it.
-Observe it closely and carefully.
-Ask questions about what you see.
-Write down the questions for later discussion.
-Write down notes and make drawings while you are in the field so that they can be discussed later.
-Use scientific instruments to help in observing.
-Test and experiment at the pond.
-Gather evidence (collect specimens) that can be studied with instruments and equipment in the science room.

Suggest that students, "try to study the pond as though we were young scientists and use some of the scientists' methods of investigating?"

Discuss what equipment is needed to take to the pond?

-Collecting tools and equipment.
-Note pads and pencils.
-Thermometers.
-Underwater viewing devices.

In case any important recommendations are omitted, ask leading questions to cause them to think of them.

Planning for exploration and discovery:

Delay teaching specifics about the pond and its inhabitants until after the pond exploration. Let the students explore an unknown world and make their own discoveries. Let the students investigate and think for themselves.

If you do tell them what the pond is and what they can expect to find, you will be robbing them of an exciting adventure in learning. Instead of exploring, discovering, asking questions and doing their own original thinking, they will be merely confirming the statements and information that you have given them.

Procedures at the Pond

Exploring the pond - a real life laboratory:

Develop the idea that the students are now in the outdoor laboratory for the pond activity. Explain that in discussing the nature and characteristics of a pond, we do not need to resort to descriptions, charts and pictures because--here it is for real!

-We can see it.
-We can smell it.
-We can touch it.
-We can hear the sounds of life about it.
-We can explore it.
-We can test and experiment in it.
-This is the time and place to learn about the pond in all of its aspects and relationships.

Reviewing methods of investigation:

Ask "Now, how did we decide that we could best learn about the pond?"

Explore the pond--

Caution students to explore the pond without disturbing it so that we can observe it closely and carefully. Take time to enjoy the beauty of the pond. Indicate the boundaries of the exploration area and establish rules and standards of safety and consideration for others. Have someone illustrate how to approach an observation post for study. Discourage any rapid movement and work for a businesslike scientific approach. If necessary discuss: "How does a scientist approach such a study?"

Observe carefully--

Ask "Why is it important that we explore and observe carefully and quietly?" It is the home of many plants and animals that live together. If we disturb their homes we will not be able to see how they really live together.

Have students write down any questions they can think of. Ask, "Do all of the living things in the pond have the same kind of home?"

Look for new discoveries--

Encourage discoveries by suggesting that, while you are exploring and observing, see if you can discover something that is alive.

Stay very still and observe it so quietly that it will go about its business of living in its natural way. Make a special study of it and try to answer as many of these questions as you are able. Use underwater viewers and hand lenses.

-What does it look like?
-How does it move?
-How is it equipped to protect itself?
-What is its special home in the pond?

Experiment and test to learn more about the organism.

-Can it see?
-Can it hear?
-Can it feel?

Make notes about your observations and experiments for later discussion. Question the things you observe

"While you are studying the organism, think of about six good questions that you would like to know the answers to. Write these down for future study."

Collect specimens--

Suggest that students try to collect the specimens they are studying (or ones like them) to take back to the science room for further study. Arrange for placing specimens in collecting containers.

Advise the students that they will meet following their field study.

Using the methods of investigation in the field:

Let students go in pairs or alone to explore and study the pond.

Let the field study continue as long as there is profitable use of the time.

Select certain students who either have finished early or who have been unable to find a good study specimen to consider the question: "Do you suppose any living thing makes its home in the mud bottom of the pond? How could we find out?"

Let them dredge with the metal net to see what they can discover for further study.

Meeting to review specimens:

Call the students together before their interests lag or divert. Let them briefly see what others have collected. There will be considerable interest expressed in naming the organisms collected. The students should be allowed the opportunity to research the names of their organisms in the copies of Field Book of Ponds and Streams kept in the science rooms.

Discussing the pond:

After a short review of specimens collected, seat the students in a comfortable place and discuss with them the nature and importance of the pond.

Take the group on a short tour to parts of the pond that were outside the limits of the boundaries for individual exploration.

Give special emphasis to the following questions:

-As you explored the pond, what were some of the observations you wrote in your notebook?

-What are some questions that come to your mind?

Take a few minutes to discuss some of the questions raised by the children. Indicate that more time will be devoted to their questions later in the science room. From time to time give direction to the discussion by posing such thought-provoking questions as:

-Is this pond important?
-To whom is it important?
-What are s ome of the kinds of living things that it provides a home for? (Fish, frogs, snakes, beaver, birds, insects, microscopic life)

Studying the pond as a habitat:

A discussion of pond exology should include:

-"The scientist refers to a home as a habitat. Is the home or habitat for pond birds the same as the habitat of the fish? Did anyone find any living things in the mud bottom of the pond?"

-"Can you think of any living things that use the pond just as a temporary home?" (migrating birds, larval stage of some insects)

-"We have mentioned several different habitats that can be found in a pond environment: plants for bird home, the water for fish, etc, mud for insects."

-"What other habitats can be found in a pond? " (underwater plants, rocks, wood, sand, the edge of the water and the surface of the water)

-"What are the conditions that go to make up a habitat - any habitat?

Soil - consistency, acidity, mineral content
Temperature - variations, extremes
Water - rainfall, humidity, underground, bodies of water
Light - and shade
Atmosphere - oxygen, carbon, nitrogen, air movement
Topography (shape of land) - shelter, slope

-"Why is the pond a good home for so many living things?"

Protection - "How is the pond able to provide protection for living things?"
Air for breathing - "How are living things able to breathe oxygen when they are submerged under water? pp. 8,9, Field Book of Ponds and Streams.
Stable environment - "Not so great extremes of temperature as found out of water. What do you think is the temperature of the pond right now?"
(Ask a student to measure the pond water temperature with the thermometer in the kit.)
Quiet, undisturbed - allows living things and non-living things to interact as a continuing ecosystem.
Food supply

"Why is the pond such a good supplier of food?"

-"Do all of the plants and animals consume the same food?"
-"Do they all eat each other?"
-"Do certain organisms eat only certain other organisms?"
-"What is the most basic kind of food in the pond?" (Plants, primary food producer)
-"What is the source of food for plants?" (sunlight, CO_2, gases and minerals)
-"Do some of the organisms eat only plants?"
-"What might we call these organisms?"
(herbivores - grazers, like cattle and sheep)
-"What might we call the creatures that eat the herbivores?"
(carnivores - predators, like coyotes, mountain lions)
-"What about an organism that attaches itself to some living thing and uses the food that the host manufactures?"
(parasites - fleas)
-"What about the remains of organisms after they die? What happens to them? Does anything eat them?"
(scavengers - buzzards, hyenas)
-"What about dead material that is not eaten? What happens to it?" (decomposers bring about decay and change the dead material to minerals and other nutrients necessary for life - bacteria, fungi)

Discuss food chains and food web of life in pond.)

-"What might happen if some single species were removed from the pond, e.g., frogs?"

Procedures in the biology laboratory

Suggest that students have learned something about the pond and how plants and animals need and use each other; that it is now time to go to the biology laboratory to learn more about the specimens they have collected.

Store the collecting tools and equipment. Allow bathroom break before going to the biology laboratory.

Reviewing plans for investigating:

Review the ways students had decided they could best learn about pond life.

- -Going to the pond.
- -Exploring it.
- -Observing it closely and carefully.
- -Asking questions about what we saw.
- -Writing down observations and questions for later study.
- -Testing and experimenting at the pond.
- -Collecting some of the inhabitants from the pond.

Orienting students to features and equipment in the laboratory:

Direct students' attention to aquaria where experimentation is being conducted to:

- -Study behavior of organisms under varying conditions.
- -Determine which organisms can live with each other in harmony.
- -Study eating habits and food.
- -Study movement of organisms.
- -Determine ability of organisms to survive in controlled experiments.
- -Observe how organisms protect themselves.

Explain the need to not disturb certain aquaria. Designate other aquaria as source for specimens for observations.

Refer to charts and audio-visual aids that can be used for reference. Introduce the references books, Field Book of Ponds and Streams, and explain how they will be used. Explain the use of bioscopes, microscopes and other instruments.

Organizing for research:

Divide the group into teams of three in order to make efficient use of the lab equipment and provide a variety of science experiments for each student.

Guiding research:

To learn all they can about the specimens they have collected, suggest that students ask:

- What is it?
  (Identify as closely as possible. Use reference books on pond life.)
- What does it look like?
  (Draw a picture of it. Use bioscope to project image down on paper on table and sketch the outline of the image.)
- To what large group (phylum) of living things does the specimen belong?
  (Refer to wall charts of classification by characteristics and have students check by comparison.)
- How does it move?
  (Cilia, legs, flagella.)
- How and what do they eat?
  (Observe.)
- How do they protect themselves?
  (It may be necessary to hazard a guess to answer this. Encourage intelligent guesses based on close observations.)
- What role do they play in the pond community?
  (Plants, herbivores, carnivores, predators, scavengers.)
- How does it relate to other living things?
  (Place the specimen with other specimens, observe relationships.)

Providing for additional experiences:

After there has been a serious attempt to do some research with specimens, allow students to explore other specimens from aquaria on an informal observation basis. Bring the laboratory research experience to a close early enough for final summary discussion.

Answering additional questions:

Help students answer some of the questions that are still unanswered.

(There may be questions that will be beyond the ability of this group with its limitations to answer. In such cases it is consistent with good science research to indicate what progress we have made with our limited time, facilities and abilities.)

Summarizing:

Help students draw conclusions and make some generalizations about the important concepts relating to the pond ecology activity. These conclusions and generalizations might well include the following:

- The pond provides many good homes for living things.
- The pond has many life zones.
- The pond is important to many living creatures including man.
- All living things are dependent upon other living things.
- Each living thing plays a certain role in the pond community.
- Organisms are classified into groups according to structure and habits.
- All living things compete to survive.

- -All living things are equipped to reproduce their own kind.
- -The flow of energy from the sun passes through the pond community as food chains and food webs.
- -Oxygen, carbon dioxide and other gases are used and supplied in cycles that can help to provide a dynamic balance of life in the pond.
- -A complete understanding of the pond must include more than scientific information about it. It must include a sensing of beauty and wonder about the exquisite order of a wonderful master plan of life.

Evaluating:

Terminate the activity with a short evaluation that includes:

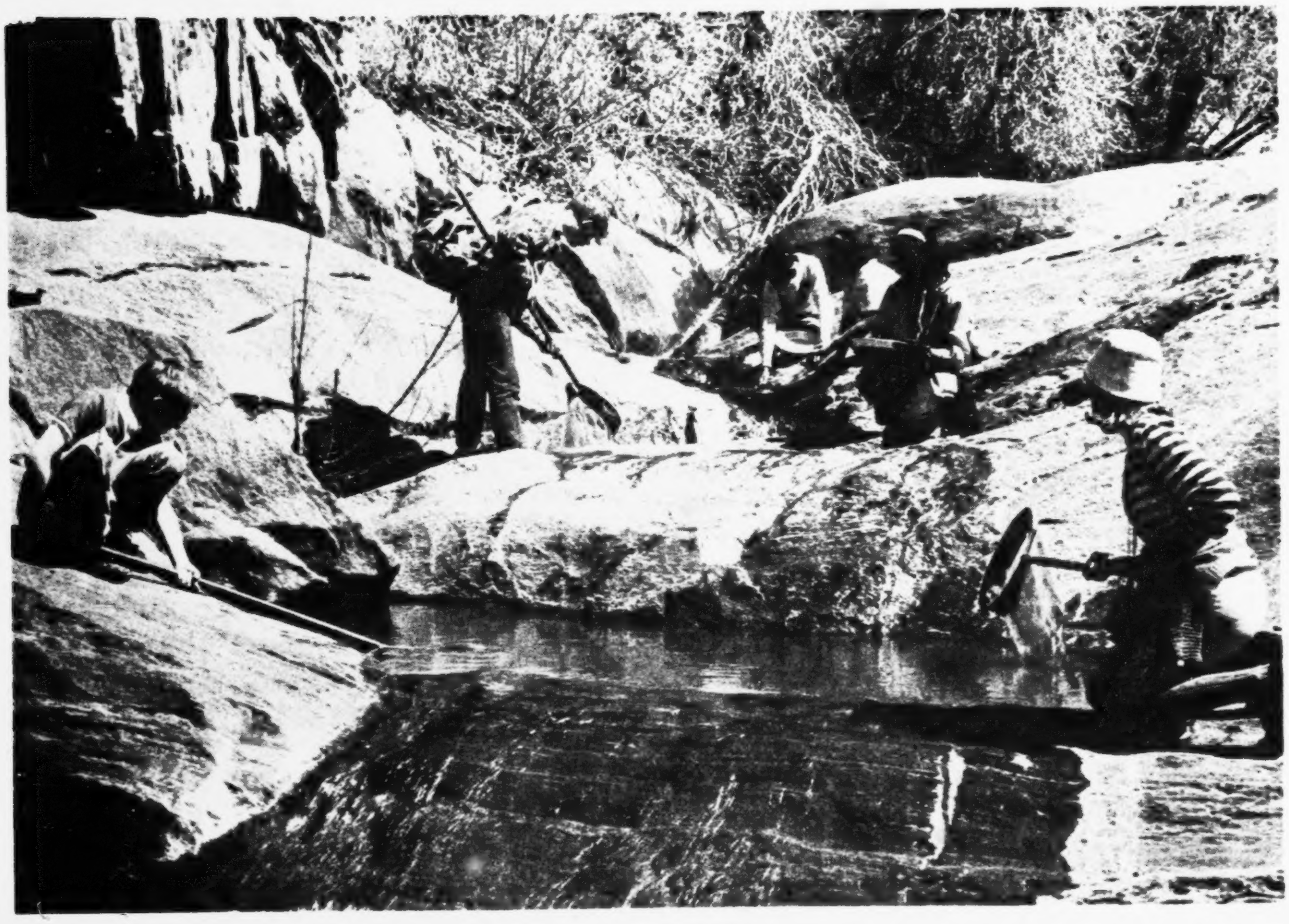
- -Do you feel that you did have an opportunity to work and think like a scientist? In what ways?
- -Is this a good approach to learning?
- -Can it be used in learning about other things than pond life? your school life? your home life?

Storing and cleaning materials and equipment:

Allow for enough time to provide for thorough cleanup of all supplies and the laboratory itself.

Planning for continued research:

Check with classroom teachers to see if they wish to take back to class any of the specimens for further study in the classroom.



FISHING

Fishing and camping are traditionally linked together in our American heritage of living in the outdoors. The fishing activity is included as a phase of the science program rather than with physical education or recreation because it is essentially a learning experience. The approach is educational rather than recreational. The pleasure of fishing is increased as appreciations and understandings are gained about fish and fishing.

Trout fishing at the camps includes stream fishing and pond fishing. The waters are planted with rainbow trout by the State Fish and Game Commission.

Children fish either as a part of a planned activity or under supervision during a free choice period. No camper fishes without teacher supervision.

The expected outcomes are that the child gains the following concepts of good sportsmanship:

- The sport of fishing is more than just an attempt to procure food; it is a fascinating contest between person and a fish.
- Fishing is a duel which involves many skills.
- It becomes a sport when the contest is about even. Emptying a lake of all water and scooping the fish up from the muddy lake bed with a shovel would be work. Using equipment that is designed to give the fish a chance and requires the fisherman to use great skill is a challenge which brings a great feeling of satisfaction with success.

-The test of a good fisherman is not how many fish he has caught, but how well he has played the game.

-Greater pleasure comes to the fisherman when he feels that he has mapped out a plan of strategy based on knowledge and executed the plan with great skill to succeed in deceiving the fish into taking his lure, whether it is an artificial or line bait.

-Of course, there is some luck involved in fishing, but more important than luck is the skill and craft of the fisherman.

The child gains the following understandings about the nature and characteristics of trout.

What kind of trout are these?

There are fourteen recognized species of trout in California waters. Rainbow trout are dark bluish-green on back, with black spots on back and tail. They have red stripes on sides and have silvery bellies.

Trout spawn on gravel bars in fast-flowing clear waters. Eggs hatch in 50-55 days depending on the temperature of water--not over 70 degrees Farenheit.

Trout are found in cool or cold fast-flowing streams and clear lakes. Trout must have cover. They like to hide under rocks, banks, among roots, etc.

Where do trout come from?

The trout come from fish hatcheries. Eggs from females are fertilized with milt from male fish. The young are kept in troughs of running water and fed until large enough for outdoor tanks or ponds. Some are planted as fingerlings. Others are kept until large enough for planting like these. Truck with air pumps aerates the water while trout are being transported. The truck drives to the lake and the fish are emptied through large pipes into lake.

What is a trout like?

-Can it see?
(Quite well, are blind to rear only)

-Can it distinguish colors?
(Primary colors. Probably responds to shape, dark and light, and motion rather than color. Do not have eyelids. Sleeps with eyes open. Eyes are protected by thin transparent skin.)

-Can it hear?
Hearing sense enclosed in a membrane that is sensitive to vibrations. Inner ear, "lateral line" nerve receives vibrations. Heavy walking, jarring of earth and water, banging of stones will frighten fish. Sound travels well in water and covers a wide area. Soft talk is not disturbing.

-Can it taste?
Probably. Sometimes rolls food in mouth and tastes before swallowing. Sometimes grabs and gulps.

-Can it smell?
Yes, they have large organs for smelling and their sense of smell is very strong. Each fish has two nostrils connected to smelling organ. Since fish do not breathe through their noses, their nostrils are not connected with their throats.

-How do trout swim?
Trout are designed for speed in swift water. Noses are pointed, shallow bodies have smooth skins (little friction). Trout swim with fins and strong tail working together.

-How do trout breathe
Like all other animals fish must have oxygen in order to live. Land animals take air into lungs by breathing through nostrils and mouth to lungs where oxygen is obsorbed from air into bloodstream. Fish takes water into it's mouth and causes the water to flow over it's gills where oxygen from the water is absorbed into the bloodstream of the fish.
Like us, the fish breathes out carbon dioxide and breathes in oxygen through the pumping action of the heart. Fish can drown! a fish must be able to close its mouth to use the oxygen in the water. If it's mouth is held open, it will drown.

-How do they eat?
Fish are greedy eaters. Trout eat mostly insects. Fish find food by seeing or smelling it. They do not chew their food, but use small teeth for biting. Fishermen sometimes cut open stomachs of trout to learn what they have been feeding upon so they can select the best bait.

Materials

-Fishing poles
-Reels
-Line
-Hooks
-Sinkers
-Bait: cheese, fish eggs, liver
-Artificial lures: flies, spinners
-Knife for cleaning fish
-Means of carrying catch
-First aid kit

Procedures

Gather the fishing group together in a good audience situation away from distractions. Discuss:

-"Why did you choose this particular activity?"

-"This is the fellow that we are all interested in" - show picture of rainbow trout.

Cover background information about characteristics of trout, history of fishing and point of view. Answer questions about background information.

Show equipment and explain purpose of each. (Spring action of pole balanced with weight of line and sinker and fish.)

Take hooks off leader and give campers practice in casting (use sinkers only). Demonstrate smooth side arm cast for distance with bait. Stress use of thumb on reel to prevent backlash. Explain use of ratchet and level winding guide.

Space the children at safe distance from each other and check the performance of each child individually. Stress accuracy more than distance.

After the children have checked out on skills of casting, demonstrate how to attach hooks, sinkers and leader to line.

Prepare the group for the approach to the fishing area. Stress fishing etiquette:

-There may be other fishermen there. Be considerate of them and do nothing that will disturb their fishing in any way.
-Remember what you have learned about how fish hear and see and walk softly, talk softly and move slowly and quietly.
-Keep out of sight and keep shadow off water.

Safety Precautions:

-Keep a safe distance away from each other.
-Check behind you and to the side to see that there is no one close enough to be snared by your hook.
-If it appears to be impossible for a fisherman to cast safely, throw the leader into the water.
-Fish only from the shallow sides of the lake. Stay away from steep slopes as there is danger of slipping and falling into the water.
-Be careful of slippery, teetering rocks.
-Be alert to danger of rattlesnakes in warm weather. They are often found near streams.
-Watch for twigs and limbs switching across eyes.

Where to fish:

-Trout are often found near the inlet and outlet of lake; under overhanging banks; under floating plant life; under small waterfalls; where two streams meet; in deep holes and sometimes in riffles.
-Trout move from the bottom of the lake to the top in order to find the right water temperature. In warm weather they seek cool depths.

-Trout also move up and down in the lake water because of different foods that are available.
-When insects appear in early morning and late afternoon, the fish stay close to the surface to catch flying insects.
-In midday they tend to seek bottom feed.

How to fish:

-Keep hidden from fish!
-Keep low and take advantage of cover, such as bushes, rocks, banks etc.
-Don't try to watch your bait, the fish can see you if you can see the bait.

What to do in case of a nibble:

-Give the fish time to swallow bait, then strike. Sometimes the trout's feeding habits may make it necessary to strike quickly.
-Don't yank the fish out of the water. Play it in gently. Always keep the line taut! A slack line will allow it to get free of the hook.
-Work the fish toward the shore, reeling steadily and flip him up on the shore. Keep the line taut and carry the fish back safely away from the water before trying to take the hook out.

How to kill the fish:

-It is merciful to kill the fish instantly. Smack it sharply with a stick just behind the top of the head to kill it.

How to take care of fish that are caught:

-Keep them out of the sun, in damp grass.
-Clean the fish (not in the lake or stream).
-Wrap in wax paper and put in refrigerator.
-Prepare fishing equipment for next fishing group.

Evaluation:

-Did you enjoy it?
-What new ideas did you learn?
-Have we left everything in readiness for the next group?

CHAPTER X

CONSERVING NATURAL RESOURCES

LEARNING ABOUT NATURAL RESOURCES

The outdoor education program affords unique opportunities for learning about natural resources.

In order to use a natural resource wisely, it is necessary for us to learn about the nature of the resource:

-Its physical characteristics.
-Its ability to renew itself.
-Its behavior under varying circumstances.
-Its relationships with other natural materials and forces.
-Its relationship to man and his needs.

We learn more effectively about natural resources through direct, first-hand and real experiences with them.

Children become intimate with nature through exploring and observing in the natural environment. The smell of the soil and growing things, the sound of the busy forest community, the fresh beauty of nature's colors and the feel of soft moss and rough bark promote a very personal relationship between the child and the natural world about him.

This feeling of intimacy leads to increased appreciation of the beauty and design in nature that results in a feeling of spiritual uplift. The child's concept of his natural heritage and his relationship to it should grow not only from the intellect but also from strong emotional and spiritual feelings.

The local scene offers a basis for developing generalizations.

The natural resources of San Diego County and their attendant problems of control, replacement and use are varied and representative of other areas. A consideration of the local scene should culminate in learnings and understandings that can be applied generally in guiding us to the wise use of all natural resources.

The outdoor education program contributes to the development of important concepts of conservation and natural science.

Some of the concepts of conservation that may be taught in connection with the outdoor education program are:

-All living things--man, animals, plants and the soil that supports them--are interdependent and interrelated. Man is a part of this complex fabric and must adjust and control to promote those relationships that will benefit not only himself but also posterity.
-The relationships of everything that are a part of the natural environment tend to work toward a balance. This balance in nature is disturbed by man as he uses natural resources. He must plan

to encourage new relationships that are harmonious with his best interests.

-Some natural resources are inexhaustible. Air, water and sunlight are examples of resources that are generally inexhaustible but which in a local area may be found only in a limited supply.

-Some resources, such as soil and minerals, are exhaustible and only through wise and careful use can the supply be maintained.

-Some natural resources are renewable. Wildlife, forests and other plants are examples of resources that can be renewed.

-The beauty and esthetic value of the natural environment is in itself an important resource which must be cherished and guarded.

-In order to use natural resources wisely and still promote desirable interrelationships, it is necessary that man understand about the nature of the resources and their role in the natural environment.

Concepts grow and develop from ideas and understandings. Understandings are best taught in the field through first-hand experiences with the resources.

The outdoor education program affords unique opportunities for conservation work experience.

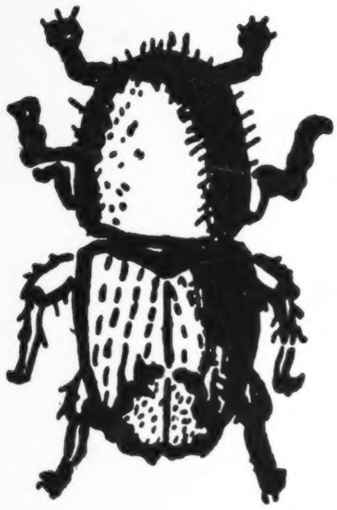
The natural environment affords a setting that is conducive to working to improve natural resources. When children feel the dramatic impact of life and death struggles in nature that are revealed to them in stark reality; when they see the ugly scar of erosion in the meandow, or the diab skeletons of dying trees in the forest, they become eager to have some part in helping to solve the problems confronting the natural resources of our land. When children work to improve the land, they give of themselves to a cause that they feel is worthy of their efforts. Each bead of sweat and each blister raised in nature's behalf become badges that link them more closely and more personally with the problems of the land. As children identify themselves with a worthwhile project, they feel a satisfaction that leads to continued interest in problems relating to the conservation of natural resources.

WORKING TO CONSERVE NATURAL RESOURCES

Controlling and Eradicating Beetles

In San Diego County more forest trees are destroyed by the work of harmful beetles than by fire. The destruction of trees increases with long periods of dry, warm weather. The dry weather weakens the strength of the trees' resistance while the warm weather increases the number of beetles that attack the trees.

Under certain conditions, beetle damage may become epidemic, their very weight of numbers overcoming the natural protection and resistance of trees. In such cases, a direct attack upon the beetles is the best method of beetle control in the forest.



Pine Engraver Beetle

The beetle control project is comprehensive in scope of learnings and exemplary of practices used in other conservation work. It is described here in detail so that it can be used as reference for other work projects.

The accepted program of direct attack is to kill as many beetles as possible. The methods employed in this program have evolved from the experiences of the staff, the Forest Service, the classroom teachers, and children working in the forest over a period of several years.

The beetle-control phase of our conservation program is conducted in cooperation with the U.S. Forest Service. Three days each week a bus load of boys and girls leaves camp at about 9:30 a.m. to go to areas in need of beetle control where they work until about 4:00 p.m. Lunch is prepared in the field and ample rest periods are provided. U.S. Forest Rangers mark the trees to be felled, limbed and barked, and oiled or burned to prevent the spread of the beetles.

At least three camp teachers, trained in conservation procedures together with a classroom teacher and sometimes a Forest Ranger, provide supervision for the 30 boys and girls involved in the control activity.

In the past years more than 1,500 trees, ranging up to 4ft. in diameter and 100 ft. in height, have been felled and treated as a part of the project. To date there has not been a serious injury to anyone working on the beetle control project.

The expected outcomes of this project are that the child:

-Feels satisfaction in having contributed to help the forest.
-Feels a sense of belonging; in participating as a member of the team in its group endeavor.
-Grows in self-relieance and dependence through learning skills of using tools.

-Grows in attitudes and skills of safe behavior.
-Develops a personal interest in the forest and problems of conservation.
-Appreciates the dignity of hard work resulting in a job well done.
-Grows in science learnings.
-Helps to make the forest a better place.

Materials and equipment

Work tools

4 saws, 2 man cross cut 5'
10 saws, Swedish bow
2 axes, falling
2 axes, cruiser
2 wedges, falling
2 wedges, splitting
2 sledge hammers
12 spudding tools
1 peavey
1 timber carrier
3 shovels, LHRP lubricating oil
1 tape measure
4 pr. rubber gloves
1 spray can of aluminum paint

Cooking equipment

Check against inventory of equipment posted in cooking kit, food for lunch

Other equipment

2 first aid kits
1 magnifying glass
2 pr. binoculars
2 compasses and map
2 pencils and forms for recording data
1 Handbook "Insect Enemies of Western Forests"
Containers for collecting insects samples

Procedures

PREPARATION FOR THE CONSERVATION ACTIVITY

It is desirable that the teachers assigned to this activity meet during or after breakfast to decide on a division of responsibility. Lack of such a meeting may result in a late departure from camp. The teachers should agree upon a designation of responsibility for the following items:

-Make the tool count and check.
-Secure cooking equipment.

- Present orientation on tool safety at conservation area.
- Supervise lunch preparation.
- Conduct evaluation of the day's activity.
- Secure equipment, cooking utensils and tools upon returning to camp.

The teacher responsible for tool count and check should:

- Make check against inventory list of all tools before the children board the truck.
- Check condition of all tools for rust, broken teeth and blades in the saws, loose axe heads and damaged handles.
- See that tools are loaded in the truck tool boxes properly.

The teacher in charge of cooking equipment and food should secure all equipment in the proper places--in the tool boxes. (The head counselor will notify the kitchen of the number of people and time of departure, preferably the night preceding the activity.)

TRIP TO THE CONSERVATION WORK AREA

Usually the conservation projects involve some traveling as most activities are not possible in the state park at this time. Thus, the work has been on either federal or private lands, making trips of ten to twenty miles necessary. Following are a few hints and suggestions that may help make the trip an adventure:

- Try to involve the total group in what you are doing.
- Start the children singing; they won't have time to think of becoming car sick.
- Point out items of interest along the way: mountains, lakes, animals, buildings, and so forth.
- Emphasize safety.
  - Be on guard for any unsafe behavior.
  - Watch for signs of car sickness.
  - On the dirt roads in the forest, watch for low-hanging branches, faces against the sideboards, arms and legs protruding from the truck or bus.
  - Make certain end-gates are hooked if traveling in truck.
  - Have an adult sit next to end-gates.

ARRIVAL AT WORK SITE

Unloading procedures:

Tell children the safety procedures for leaving the truck or bus. Children leave truck one at a time by first sitting down on the truck bed and then sliding off to the ground. The truck bed is high; serious injury may result when jumping from a standing position.

Select area for children to meet for briefing on tool description, safety and usage.

Allow children time to stretch and ease the stiffness resulting from travel.

Overview of day's activities:

Give the children an over-all picture of the day's activities to remove many uncertainties, answer questions, and eliminate much unsafe activity, such as wandering and inattentiveness.

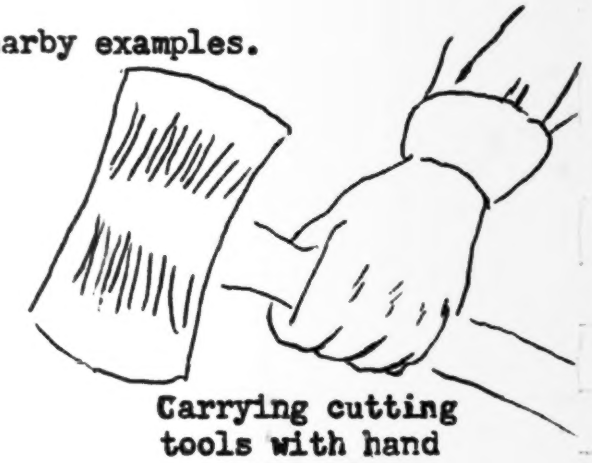
- -Why are we here?
- -How can we identify the "bug trees?"

Refer to the Monday night slide story. Use nearby examples.

Orientation for safe use of tools:

Orientation acquaints campers with the tools they will be using.

- -What they are used for.
- -How they are used.
- -Safety in using tools.
- -Passing and carrying procedures.



Carrying cutting tools with hand near the blade.

Carrying tools to work area:

Students pass by piles of tools, pick them up, and form a single-file line (10 ft. interval) for the walk to the work area.

SELECTION OF THE DEMONSTRATION TREE

While carrying tools from the truck to the work area, encourage campers to look for signs of beetle-damaged trees. If possible, select a small tree to fell in order that the children assigned to prepare lunch will be able to take part in all phases of this project. Inform the children preparing lunch that they will have an opportunity to work on the trees in the afternoon.

FELLING THE TREE

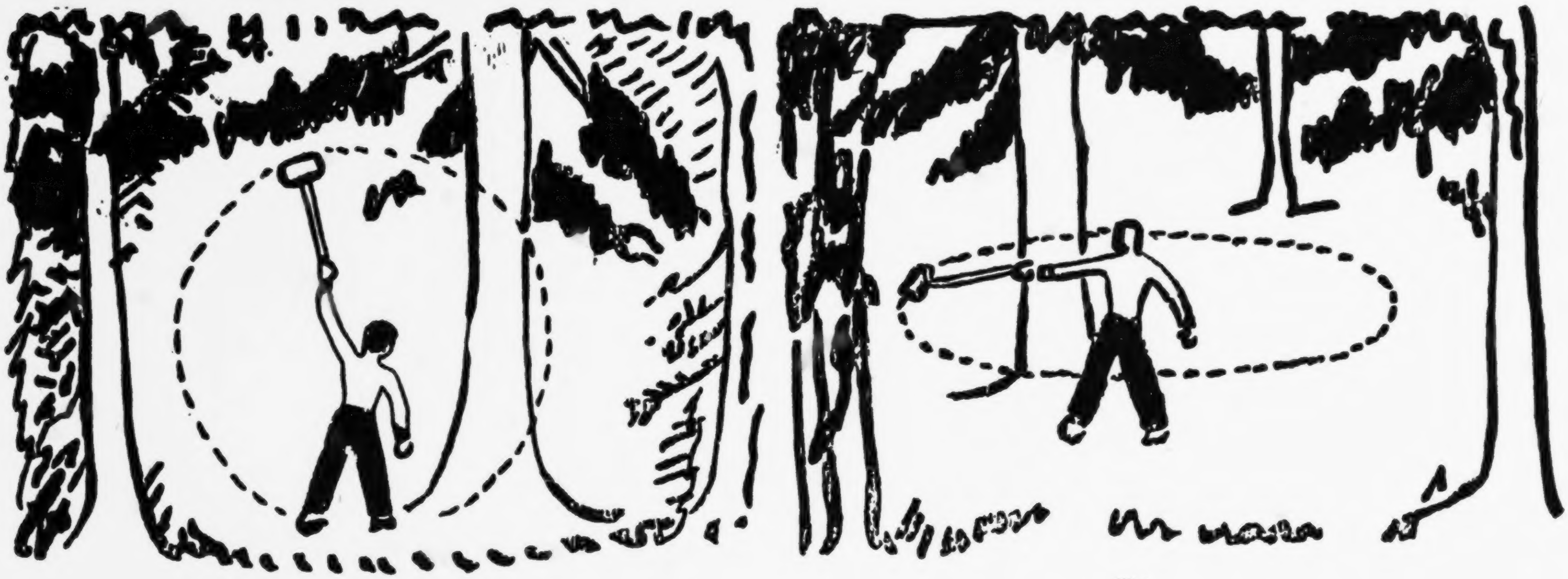
Reasons for felling the tree:

Explain how a tree grows, which beetles killed it, and how they killed it. A stump of a recently felled tree will illustrate these points exceptionally well. Additional information concerning the history of the area, lumbering, past fires, and recreation facilities might be given.

The children should understand the importance of felling only those trees in which the beetles are present, and dead or dying. They should also know that a time factor is involved; that trees containing adult beetles are felled before those housing larvae.

Preparation for felling the tree:

Clear an area around the tree in all directions to allow free and unobstructed use of all tools. This includes "widow makers" from the tree to be felled and those surrounding trees which obstruct the work area.

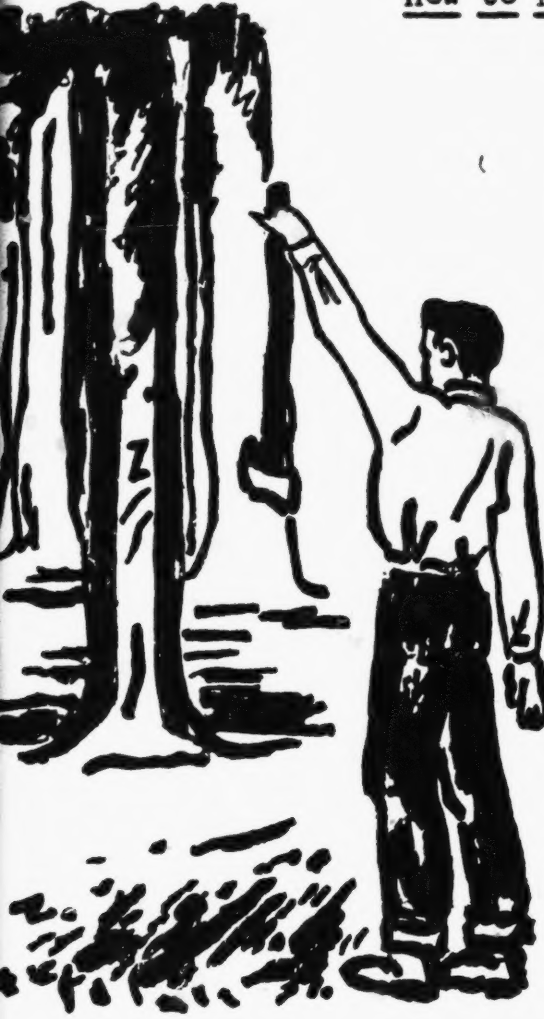


Carry this "slash" to an area where it will not be in the way of yourself or others.

Factors to consider in determining the direction of fall are:

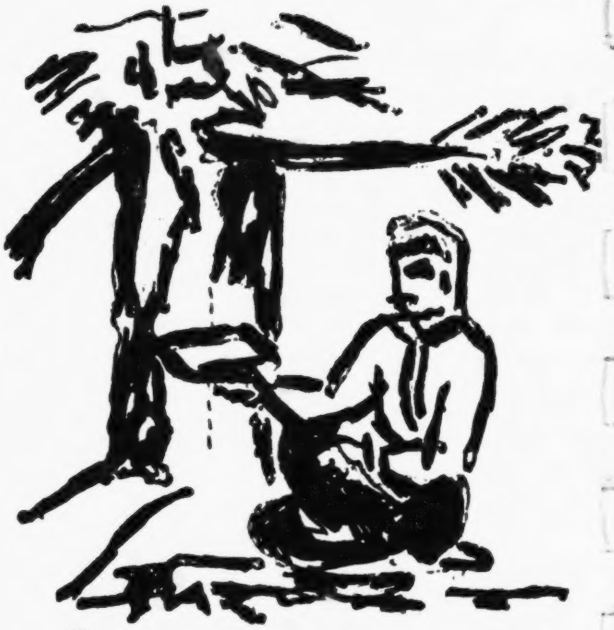
- -Lean--use axe as a plumb to determine degree and direction of lean.
- -Wind direction, and strength.
- -Distribution of limbs--all on one side or enough weight on one side to influence fall.
- -Surrounding trees.
  - . "Hang up" can result.
  - . Will the fall injure young and healthy trees?
- -A clear area for working on tree when down.

How to Fell a Tree:



Make center mark--

The center mark may be made by placing the head of the axe against the tree and sighting down the handle to the desired line of fall. That point where the center of the axehead meets the tree will be the center mark. Mark this spot on the tree bark with the axe as in the diagram.

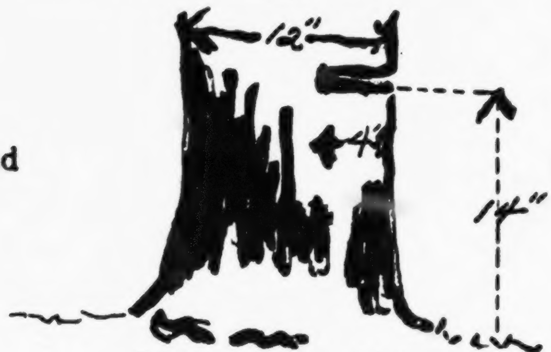


The handle points where the tree will fall.

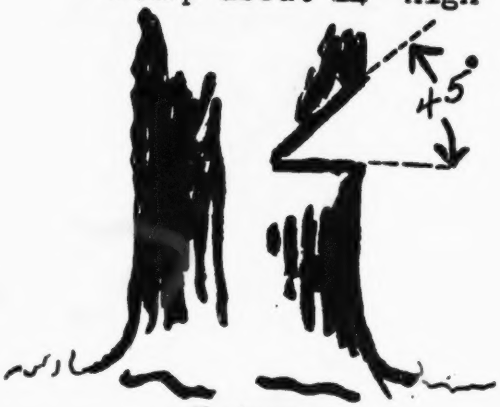
Undercut--

Purpose is to place tree off balance in direction of fall.

- Remove bark, as it contains mineral matter which will dull the saw.
- Begin undercut about 14 inches above ground horizontally in a line perpendicular to line of fall as determined by centered mark.
- Keeping saw level, saw into tree to one-third of diameter.
- Chop out wood above undercut using an axe or saw to a 45 degree angel.
- There should be no cutting beyond line of undercut as it may alter direction of fall.



Stump about 14" high

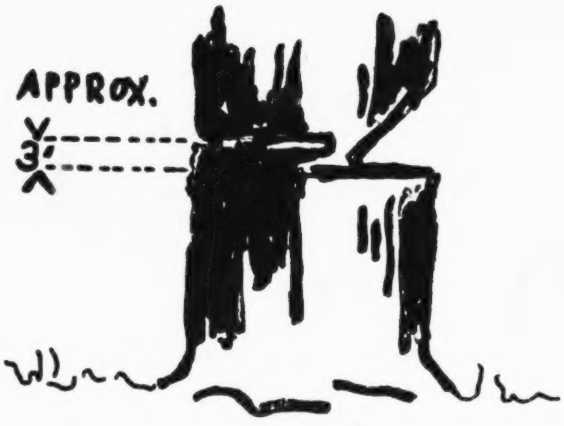


Undercut

Backcut--

The backcut fells the tree and is made on the side of tree opposite undercut.

- Clear away bark.
- Begin backcut (2-man cross-cut saw) 2" to 4" above and parallel to the bottom line of undercut.
- Clear away an escape route.
- Establish lookouts to be certain all other campers are twice the height of tree away.
- Campers working on trees nearby should be warned of impending fall and moved to safety.
- Continue backcut keeping parallel to undercut.



Backcut

-"Fellers" check with each other from time to time to be certain the backcut is parallel to the undercut or to the desired shape.

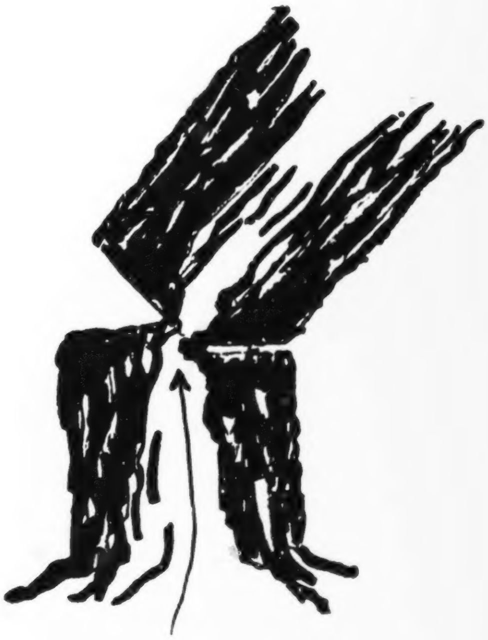
T-I-M-B-E-R--

When the tree begins to fall, if possible pull out the saw, place it on the ground and run via the planned escape route. The tree may fall at any time during any one of these operations; thus, counselors must think ahead and prepare for any eventuality. Such factors as lean, distribution of weight, wind and rotted inner wood can cause a premature fall.

The Bridge--

In most instances the tree will fall before being completely severed by the backcut. That part of the tree which is left uncut when the tree falls is called the bridge. A wedge-shaped bridge has the effect of pulling or swinging a tree in the direction of the thick end of the bridge. The shape of the bridge may be altered deliberately to compensate for any errors in the undercut and for unforeseen wind conditions.

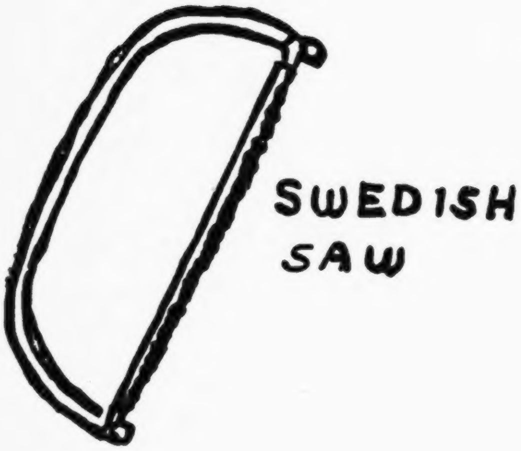
In many instances when the tree falls, it still may be connected to the stump by the bridge. In this condition the tree is still dangerous and may roll either way. When the tree has fallen, the children will want to rush to it. Do not allow them to approach the tree until you have severed the bridge, pushed the tree from the stump, and are certain that the tree is firmly settled upon the ground.



The bridge acts
as a hinge.

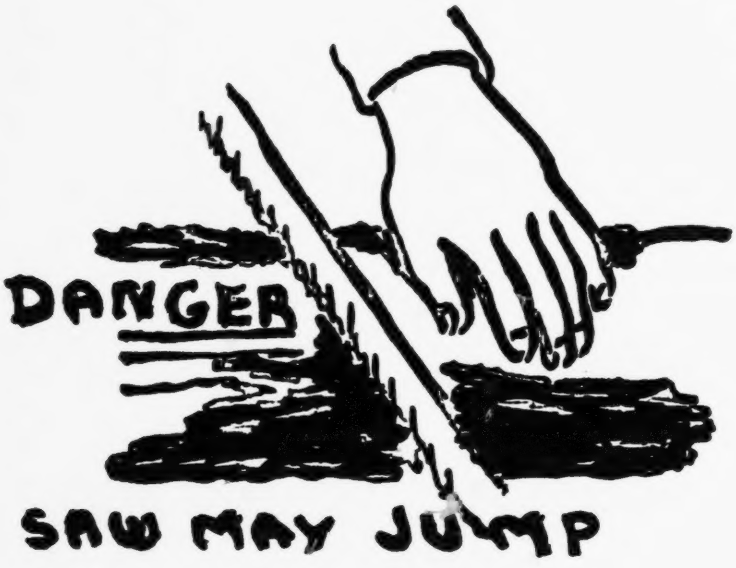
TREATING THE FELLED TREE

Limbing the tree:



Cutting off the branches is the next step using the Swedish Bow Saw. Care should be exercised in teaching the children to use these saws, as the blades are easily broken.

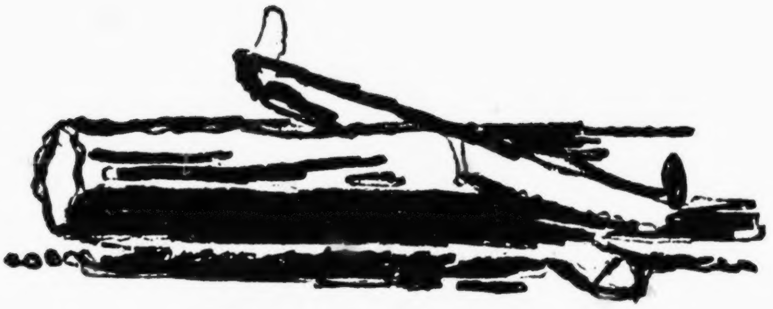
Limbing can be a dangerous activity if not carefully supervised. Cutting the branches that support the tree off the ground is dangerous and should be done by an experienced camp teacher. The children should concentrate on cutting off only those branches which at no point touch the ground. The teacher is the one who will bring the trunk to the ground. Be alert, the trunk may fall in either direction.

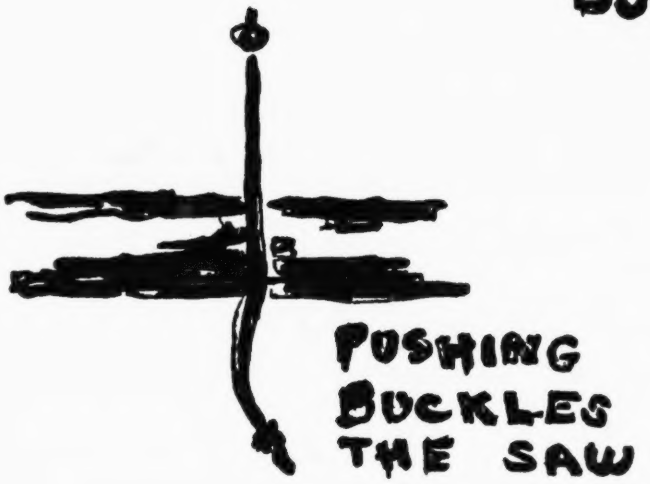


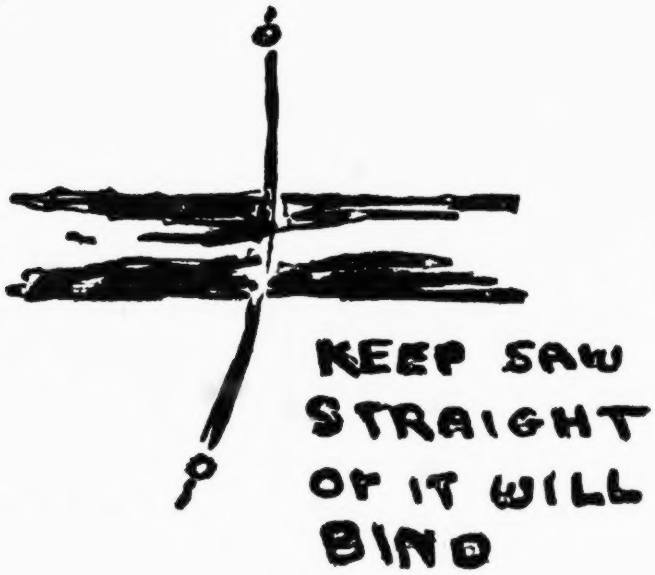
Repetition of demonstration and orientation on proper and safe usage of tools is in order at all times. However, do not scare the campers to the extent that they will be tense and afraid to use the tools. Create interest, not fear.

Carrying the slash away:

The limbs cut from the trees are called "slash." Spread the slash in the surrounding area where the sun may reach it. Do not pile the slash as it provides a breeding ground for the beetles. Treat all large limbs and the stump.




PUSHING
BUCKLES
THE SAW

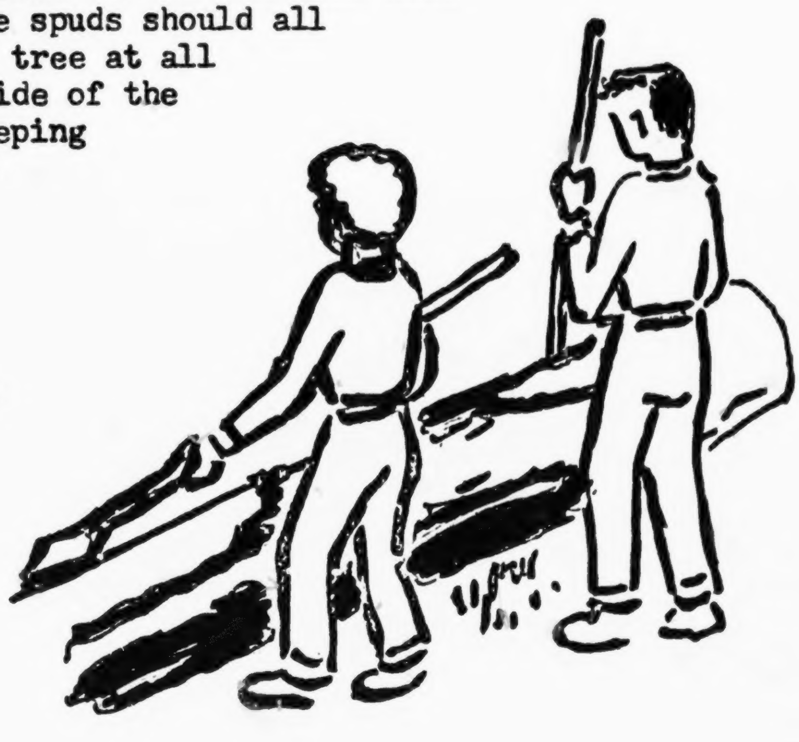

KEEP SAW
STRAIGHT
OF IT WILL
BIND

Bucking:

To "buck" the tree is to cut it into lengths, usually 10 ft., to make for easier handling. Wedges and sledges may be needed to keep two-man crosscut saw from binding.

Spudding:

To "spud" a tree is to remove the bark with chipping tools called "spuds." Spudding is done when the beetles are in the larvae stage and unable to fly. Exposure to the sun will kill the larvae. Children using the spuds should all work from the same side of the tree at all times. They should spud the side of the log that is away from them, keeping the log between their legs and the blade of the tool.



Peeling the bark
with spuds.

Oiling:

When the beetles are in the adult stage and have wings, spudding would make their departure from the tree much easier. Thus, oiling is necessary. The insecticide has an oil base for greater penetration into the bark. The entire length of the trunk is oiled including the stump. Use sprinkling cans made of one gallon cans with perforated screw caps. Extra screw caps without perforations can be used to carry oil without spilling.

- -Oil the far side of the tree so as to not splash the insecticide on yourself.
- -Wear rubber gloves.
- -Record necessary data required by the Forest Service.

Burning:

In damp weather, the slash is sometimes burned, together with the chipped bark. A clear area, a good fire line, proper weather conditions, and adequate supervision are necessary for burning procedures.

LUNCH PREPARATION IN THE FIELD

The teacher, (usually a woman teacher) and students leave to prepare lunch after the tree-felling demonstration, while the rest continue beetle work. She will generally be assisted by either a classroom teacher or a student teacher.

The cooking area should be absolutely free from fire danger. Use established facilities if possible. Clear with forest ranger. Limit all cooking to the stoves. No open fires should be allowed.

Choose six or eight campers to aid in preparation--gathering wood, etc.

Insist on safety, cleanliness and thrift by all children.

Lunch time

- -Easy and relaxed; do not rush.
- -No running around after completing meal.

Cleanup before resuming activity

- -All cooking equipment returned to truck.
- -Area clean of all paper and trash.
- -BE CERTAIN THE FIRE IS OUT!

REST TIME IN THE FIELD

Rest time in the field will not be the full hour rest as in the cabin. However, at least fifteen minutes is desirable. Weather and temperature and the group itself will determine the length of the period. Teachers should be on the watch for signs of over-tiredness throughout the day.

PROCEDURES FOR LEAVING THE WORK AREA

Departure time is predetermined by the camp teachers. To insure an orderly departure:

- Allow time to depart on time.
- Plan the work so that the felling crews do not drop more trees than can be treated before you leave.
- Check to be certain no tools or clothing are being left.
- Leave no trash in the forest.
- Check all equipment against inventory list when being loaded on truck.
- Return all empty insecticide cans to be refilled.
- Oil the saws and axes to prevent rust.
- Check to be certain the cooking fire is out.
- Make sure all children are warmly dressed for the return trip.
- Call roll of all children; counting is not sufficient.
- Allow enough time for disposal of all equipment upon arrival at camp.
- If the teacher is conducting the evaluation at the work site, allow time.

EVALUATION

The evaluation is as important as any part of the activity. Do not slight it.

Evaluation is best held at the work site where the children are able to see what they have accomplished. Suggested questions for discussion are:

- Did you enjoy the experience? Why?
- Did we achieve our objectives for the day?
- How have we helped the forest?
- What new things have we learned?
- Why is it important to work together as a team?
- Do we now understand that the forest is more than merely trees; that it is a community?
- Did you enjoy preparing the lunch? Did you have enough to eat?
- Did you work hard? Was it fun? Why was it fun?
- Do you have a closer feeling for the forest, because you have helped it?

Sample Form of Data Required

by the

Forest Service

TREE NO.	TREE SPECIES	KILLED BY	DIA. AT 4 FT.	LENGTH TREATED	DATE TREATED	GALLONS INSECTICIDE USED	BEETLE LIFE STAGE	COMMENTS

Planting Trees

Forests in San Diego County are a very important natural resource. These forests are subject to ravages and attacks from many sources including fire, insects, drought and inconsiderate humans.

It is necessary to do more than to try to control the attacks by the enemies of trees. It is necessary to carry on a continuing program of replacement of trees through planting projects.

Tree planting is done in the camp program in many ways. Many of the methods are done experimentally in an attempt to gain additional knowledge about best procedures for planting trees.

Some of the methods used are:

- -Planting seeds under controlled conditions.
- -Transplanting "wildlings" (wild seedlings) from a congested site to an area of need.
- -Planting bare root stock supplied by U.S. Forest Service according to their specifications.
- -Planting potted stock supplied by U.S. Forest Service.
- -Planting seedlings from camp nursery.

The wet season from December through April is largely devoted to tree planting. During this period thousands of trees are planted under the technical supervision of the U.S. Forest Service.

The expected outcomes from the project are essentially the same as in beetle control.

The child also:

- -Finds satisfaction in digging in the rich, damp earth.
- -Identifies himself with the miracle of life and growth. He carries in his memory the knowledge that he has contributed to life in the forests.

Materials

Tree planting tools: shovels or mattocks.
Supply of seeds or seedlings.
Carrying bags for seedlings.
Containers for watering seedlings.
Stakes for marking seedlings.
Protective coverings for seedlings.
Cooking equipment as described in beetle control activity.
Other equipment as described in beetle control activity.

Procedures

The following phases of the tree planting activity are similar to those described under beetle control.

- -Preparation
- -Trip to work area
- -Arrival at work site
- -Unloading procedures
- -Overview of day's activities
- -Orientation for safe use of tools
- -Lunch preparation in the field
- -Rest time in the field
- -Procedures for leaving the work area
- -Evaluation of day's activity

The most common method of tree planting has been to plant bare root seedlings furnished by the U.S. Forest Service. The seedlings are planted in an area where bulldozers have scraped all brush and weeds from the surface. This "scalping" is done to remove vegetation that competes with seedlings for moisture.

ORGANIZATION OF WORKERS

Supervision and help can provided more efficiently and effectively if the children are divided into smaller working crews that are then supervised by designated teachers. These crews should move away from each other to prevent milling, crowding and improper planting.

Each crew should then be subdivided into teams of three workers each. The teacher will select certain children to service his several teams in providing seedlings, fertilizer and stakes. Children may be rotated through these responsibilities.

In the orientation, stress should be placed upon the need for great care in planting. It is better to plant one seedling properly than to plant twenty seedlings improperly. Constant and careful checking must be done continuously. Repeated demonstrations will be necessary.

Some of the planting practices that should be especially stressed and checked are:

- -NEVER ALLOW THE SEEDLING ROOTS TO BE EXPOSED TO THE AIR FOR AS MUCH AS A MINUTE. This is a most critical point to check since the seedlings will die immediately upon prolonged exposure.
- -Have the freshly dug hole ready for the seedling. Have each member of the planting team ready in position to carry out his responsibility promptly.
- -Check each hole for depth and shape. Check the earth that is piled ready for packing around the roots.
- -Hold the seedling high enough in the hole so that the roots can hang down straight and free.
- -If fertilizer is provided, mix with dirt in bottom of hole before planting seedling.
- -Be certain that all air pockets are excluded from the roots. Any air that remains will dry out the roots and kill the seedling.

- Pack the earth firmly around the roots as the seedling is held in place against the straight back side of the hole.
- Use the heel of the boot or shoe to pack the surface. Be careful not to injure the seedling while tamping.

-Pack earth to depth that seedling had been planted in the nursery.
-Shape depression around seedling to catch runoff.
-Mark seedling site with lath or other stake.
-Provide shade with slash.
-Dig next hole about 8' distance away.

Controlling Soil Erosion

When the mountains of San Diego County were formed by subterranean forces, the ground level was elevated over 6,000 feet above sea level. These mountains created a barrier to eastward-moving storms which resulted in great increases in rainfall.

The action of heavy rains falling on high mountains leads to rapid movement of large quantities of surface water over sharply descended watersheds. Fast moving water means soil erosion.

Most erosion is beneficial. If it were not for erosion we would not have soil in fertile valleys. We would not have our scenic canyons and rich deltas. Unfortunately, some kinds of erosion are harmful to man's best interests. It is necessary that certain controls be established to control the erosion that is harmful.

The mountains of our back country afford many fine examples of soil erosion that is undesirable. The outdoor education program provides children with opportunities for participating in work projects designed to control such erosion.

Soil erosion control work projects are especially well suited to the use of problem-solving techniques.

- The problems are readily observed by the students.
- Their solution is within the abilities of the students.
- The students can participate actively in the solution.
- The students can see and evaluate their progress in terms of actual construction.

Soil erosion control in the school camp conservation work program is accomplished through the following activities:

- Gully erosion control.
    - Building gully plugs
    - Constructing rock aprons
    - Planting sod
    - Diverting the flow of surface water with berms
    - Building check dams
- Sheet erosion control.
    - Wattling with tree limbs
    - Planting sod
    - Constructing retaining walls

The expected outcomes of the erosion project are that the child:

- Understands the nature and value of soil.
- Appreciates the problem of conserving soil.
- Develops a sense of proprietorship in soil through his personal efforts in trying to conserve it.
- Gains understanding similar to those listed under the beetle control project.

Materials

Work tools

10 shovels LHRP
5 shovels LH straight cutting edge
1 crow bar
2 picks
6 mattocks

Cooking equipment

Same as beetle control

Other equipment

Same as beetle control

Procedures

The procedures for the following phases of erosion control work projects may be found in the description of the beetle control activity:

- -Preparation for the activity
- -The trip to the work area
- -Arrival at site
- -Unloading at site
- -Orientation to day's activities
- -Orientation and demonstration of safe use of tools
- -Preparation of lunch
- -Rest time in the field
- -Departure procedures
- -Evaluation by campers

Encourage children to discover and identify the soil erosion problem. Set the stage and use questions that will lead to the discovery of the problem.

- -Discuss the probable causes of the erosion problem.
- -Develop an engineering approach to the development of a design that will adequately control the erosion problem.
- -Discuss the problems involved in carrying out the plans for control.
- -Discuss the possible use of available material. Consider the relative merits of each.

rock
brush
earth
grass
limbs

- -Discuss the engineering design of proposed structures. Weigh the advantages and disadvantages of each.

-Teach the major concepts about soil, water and erosion that are listed in Chapter VIII.
-Consider such problems of erosion as:

Undercutting action of surface of water:

As surface water pours over the edge of a bank it may whiplash back under the sod to continue the undercutting action. This leaves the roots of the sod dangling in the air so that the sod cannot anchor the soil to allow surface water to flow over without undercutting.

Live fingers of erosion:

This undercutting action exists not only along the sides of main gullies but especially along the banks of fingers of erosion that reach out into the meadow to widen and lengthen the main gully.

Loss of topsoil:

If the erosion continues, the rich topsoil of the meadows will wash downstream and leave the less fertile subsoil exposed.

Lowering of water table:

As the gully deepens, the water table of the meadow lowers and causes the meadow to become dryer so that it will support less grass for grazing. The resulting overgrazing encourages further soil erosion.

Action of Rodents:

The problem of gully erosion is further aggravated by the action of rodents digging holes near the edge of the banks. Water washes soil down these tunnels which cut below the sod surface into the gully. This accelerates the rate of erosion of the gully.

EROSION CONTROL STRUCTURES

Rock plugs and rock aprons:

These are variations of the same structure. They are both designed to provide a stable surface over which water will flow without eroding.

The advantage of such a surface is that it can be placed strategically at the upstream tip of the finger of live erosion and prevent any further upstream extension of erosion.

The plug is so called when the structure is confined to a compact mass of rock which plugs a narrow channel where the water falls from one level to another. The plug allows the water to fall over the rock surface without erosion.

The rock apron is similar in design and function except that the rocks are not confined to a narrow spot but are spread out over a graded slope so that the water descends from one level to a lower level by flowing down over a sheet of rocks.

In both structures care must be given to fit the rocks so that they rest tightly against the ground. They must be able to settle and maintain a bond with the earth so that channels of water cannot develop in the earth under the rock.

For this same reason special care must be given to the upstream edge of the structure. The rocks must always weigh upon the bare earth. If earth and rock meet vertically the earth may pull away by erosion upstream from the rocks.

Check dams:

Check dams should be used with discretion; they can lead to increased erosion in some cases.

The chief purpose of check dams is to slow the water by causing it to form a pool. The very body of water that collects behind the dam is an erosion factor if the dam should give way when the stream is in flood. In general, check dams should be kept small in size.

Diversion berms:

A berm is a raised ridge that acts as a low retaining wall to direct the flow of water. These can be made of many materials. There is danger that diverting water may cause it to concentrate in an area where erosion may result. The chief value is to direct water away from areas of high erosion hazard.

BUILDING EROSION CONTROL STRUCTURES

Gather rock for structures.

- -Demonstrate to children the correct way to lift a rock.
- -Discuss the maximum size of rocks to be handled.
- -Discuss dangers of rolling rocks and establish preventive measures.
- -Give all children a chance to carry rock at first until a good supply is collected.

Prepare the new slope.

- -Take part of the crew for preparing the apron or plug slope.
- -Strip the sod from the area to be sloped and store sod for future use. Cut sod squares about 4" thick.
- -Shape the new slope with shovels.

Build the rock structure.

- -Place larger rocks securely at base of plug or apron for good footing. Build up from base, fitting carefully.
- -Concentrate rock structure to center of graded slope and flank rock with sod squares to encourage growth and "healing" of the slope.
- -Water the sod thoroughly or pack with snow.
- -Cover all of the newly sloped area with either rock or sod.

In placing rock in check dams, anchor the rock securely to the sides or banks of the gully to prevent water from flowing around the dam.

Design the top of the dam so that it slopes down from both sides to the center to direct the flow of the stream over the rocks in the center of the check dam.

LUMBERING
S OUR TS

CHAPTER XI

EXPRESSING CREATIVELY

LANGUAGE ARTS

Language is rooted in and emerges from experience. The week in the outdoors is filled with experiences that elicit feelings of anticipation, excitement, thrill, enjoyment, fellowship, suspense and spiritual awakening. The quickening of emotion, the stirring of imagination and the stimulation through sensory experiences motivates children to express themselves.

Participation of children in purposeful, real-life experiences leads to increased insight and understanding and provides a good basis for communicating with others.

The opportunities for language experiences in the outdoor education program are varied. Some of the opportunities will be incidental; some will involve planning. There are many opportunities for oral expression; some for written expression. Much of the language will be creative; most of it will be for the purpose of communicating ideas.

Oral Language

INCIDENTAL

Most of the oral language at camp will be spontaneous expressions growing out of the immediate experience. The teacher should encourage such free expression in appropriate settings.

PLANNED

Direction and growth in oral expression can be provided for through certain experiences where careful preplanning by the teacher can lead to increased student satisfaction and performance.

DISCUSSION GROUPS

Group discussions are oral language experiences in which planning can lead to improved performance. Some outstanding examples of camp activities involving group discussion are:

- -Orientation discussions.
- -Evaluation discussions.
- -Sharing periods.

The techniques involved in conducting good group discussions are illustrated in the following description of the sharing period. Many of the procedures described can be applied in other group discussions.

Sharing Period

The children are highly motivated to express themselves because of the many varied and interesting experiences of their camp program. They are bubbling over with many things they wish to share with others. Discoveries, new experiences, humorous incidents, adventures, suspense, and beauty have moved them. They not only have something to say, but they know what they are talking about because they have experienced the things they want to discuss.

A major portion of at least one of the evening programs (usually Wednesday) is planned for students to recall and share interesting experiences. The advantages of a small discussion group usually lead the teachers to limit this activity to a single cabin group. There may be times, however, when a group may want to invite another cabin group to join in sharing experiences.

The expected outcomes of the sharing period are that the child:

- Expresses himself. In this informal and enthusiastic atmosphere every camper is encouraged to contribute to the discussion. This may be the first time the child has ever voluntarily expressed himself to the group.
- Feels the satisfaction of making a contribution to the group.
- Gains desirable recognition.
- Gains confidence in speaking before the group.
- Grows in his ability to use good descriptive words.
- Practices courtesy and consideration in listening to others.

Materials Needed

Adequate clothing for campers in night air.

A campfire if possible; a simulated campfire (red light, etc., in center of circle)

Hair pads to sit on for warmth and comfort.

Materials that have been found by children and which will serve as centers of interest for discussion.

Suggested Procedures

The teacher can set a desirable tone by his own friendly, easy, relaxed manner. He should be careful not to formalize and stiffen the atmosphere by over-structuring the activity with rules, standards, objectives and admonitions. It is very true that he will be mindful of certain goals and standards, but he should try to achieve this incidentally, in a subtle, informal manner.

The teacher's guiding influence should be constructive and should result in encouragement. He should be alert to capitalize upon children's ideas, words and expressions of children that can be used to illustrate points that are consistent with his goals. More emphasis on pointing out good examples and less emphasis on what not to do results in increased satisfaction and encouragement on the part of the campers.

The teacher:

-Provides for an informal arrangement of children and teacher for audience situation.

A circle formation allows all to see, yet singles no one out. The reticent speaker may remain in the group while speaking his views. A scattered group will not be conducive to participation, especially in younger children where attention span is short and interest wavers.

-Plans for an informal relation between children and teachers.

Guard against over-familiarity and resultant sacrifice of rapport. Give brief preparatory remarks expressing the need for courtesy. Encourage the children to contribute in voices loud enough for all to hear. Prepare the members of the audience to listen quietly, awaiting their turn.

-Encourages participation of all children.

Discourage a conversational monopoly by a few and attempt to draw out the more retiring child. Be sure that questions directed to shy children are easy enough to insure successful answers.

-Encourages favorable speech habits.

Emphasize certain words.
Vary volume for expression.
Change pitch.
Pronounce carefully and enunciate clearly.

-Promote the use of descriptive words.

Promote the use of words that appeal to the senses (sight, sound, smell, taste, touch) to add color to the conversations. Point out their values, so listeners may share experiences with the speaker.

Ask questions which will subtly require adjectives or adverbs to further describe sights or activities. Be alert to repeat excellent descriptive words children use in the discussion and use them as examples.

Use words that will enlarge the listeners' vocabulary. Do not "talk down" to the children. Check to make sure the vocabulary you use is on the listener's level of understanding.

-Develop the detail and elaborate.

Demonstrate that detail tends to bring more vivid description.

-Direct the discussion.

Discourage aimless rambling accounts of events that have occurred. Give leadership by posing questions whose correct answers will lead to desired outcomes. Introduce new questions that will re-direct wandering sentences when interest in a subject lags.

-Show interest.

Set an example for children. Needless to say, a blase, disinterested manner on the part of the teacher will lessen the enthusiasm of the group. The teacher's manner will tend to set the tone for the group.

Individual Reports to Group

Interest in certain areas of camp living and support of campers who have accepted some responsibility in particular areas can be increased by encouraging monitors to report to the group about needs and progress. The teacher can give prestige to the report by his own manner, which should denote interest in a very important report. The reporting camper should feel a degree of success and satisfaction as a result of this kind of language experience.

Creative Oral Expression

Some examples of the activities involving creative oral expression are: (1) choric verse, (2) camp skits, (3) exploratory work with wire or tape recorder, and (4) acting as master of ceremonies.

The planning for this kind of language experience should be directed toward providing opportunities for creative expression. The teacher's direction of these activities should not interfere with the creative expression of the child. However, he should keep informed about such creative activities and should check all skits, etc., to see that they are suitable and appropriate to present to the group.

Written Language

In the pre-camp experiences described in the Teacher's Guide Outdoor Education suggestions are made to prepare the students for written language experiences at camp.

They have been encouraged to write letters and have had review in correct form for letter writing.

They have learned of the values of keeping a diary and have probably had some practice in diary writing.

They have studied the possibilities of newspaper reporting and have been given some preparation for reporting on interesting aspects of the outdoor education program.

At camp it is very desirable for the teachers to promote and provide for follow-through in written language projects. Make sure the children understand which times are set aside especially for writing. Keep writing materials available in a conspicuous location. Give special emphasis to the posted charts and aids which illustrate proper form in letter writing.

Vocabulary Building

Many new words can be learned as direct outgrowths of participation in new experiences.

Some of these new words can be anticipated and spelled out on vocabulary charts. Others can be added to the new word list provided for student use. It helps the child to realize growth when they can see the evidence of progress in vocabulary building.

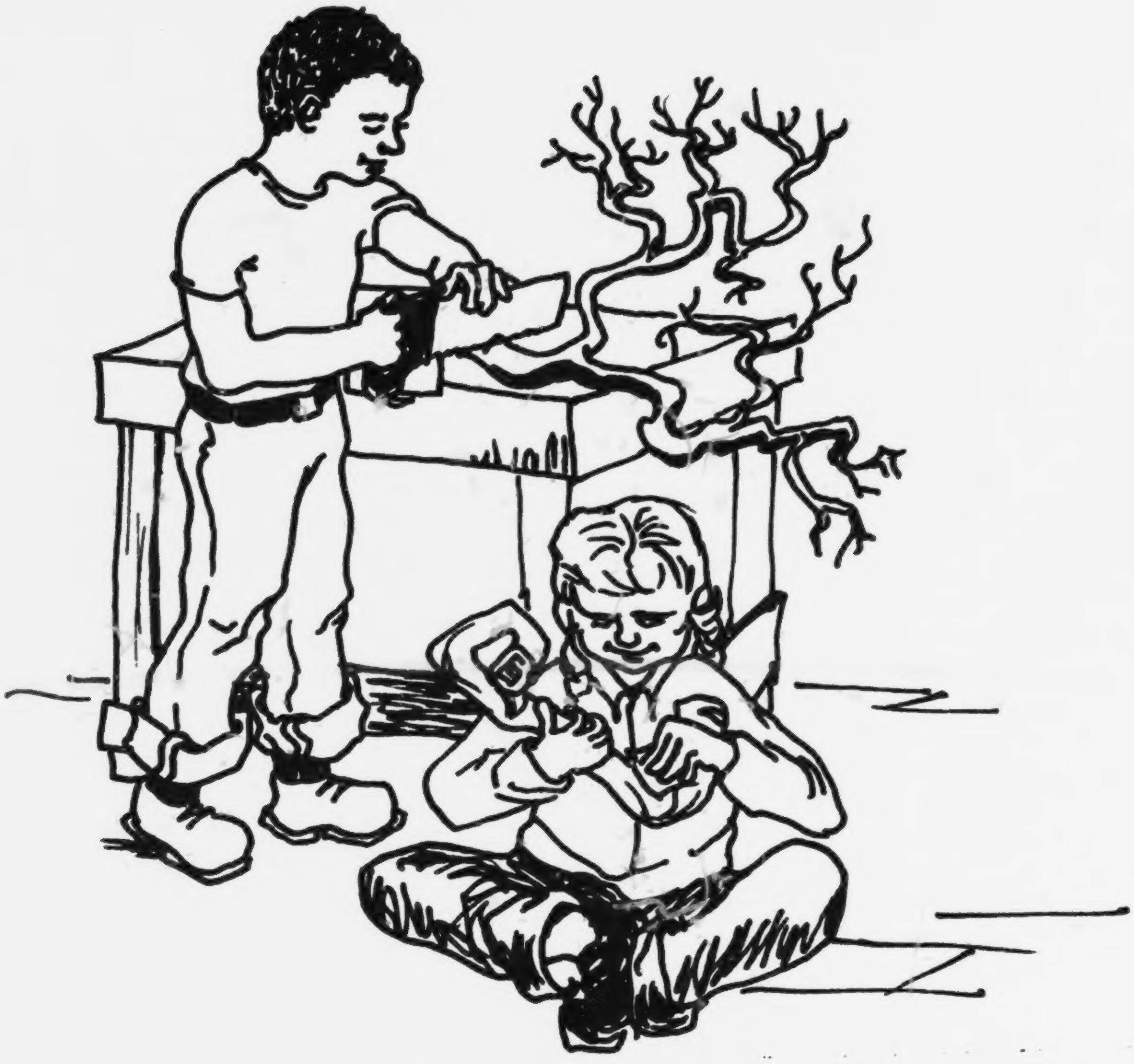
ARTS AND CRAFTS

Arts and crafts activities in the outdoor education program provide a happy marriage of science and art. Learning about the natural environment leads to intelligent use of the environment. A very satisfying way of using the materials of the environment is in creating objects that express ideas and feelings.

Man has long been fascinated by the challenge of pitting his own resources against nature. The primitive urge to employ ingenuity in working directly with natural elements to cause them to serve his purpose finds expression in the camper as he locates and collects natural materials which he shapes artistically.

Increased understanding of the natural materials results in greater appreciation and a stronger feeling of competency in the artist-craftsman.

There is no limit to the kinds of materials that can be used in arts and crafts activities at camp. Experimentation in new media is encouraged.



Some of the kinds of materials that are commonly used in the craft program are:

-Rock (soapstone and alabaster gypsum) - sculpture.
-Rock (quartz family) - flaking arrowpoints.
-Rock (interesting shapes and colors) - arrangements.
-Clay (formed from decomposed granite) - modeling.
-Wood (incense cedar, soft pine) - carving.
-Wood (willow) - carving, "memory sticks", whistles, figures.
-Bark (pine, cedar) - carving, arrangements.
-Chaparral (manzanita, lilac, chamise) - lamps, book ends, letter openers.
-Seed pods (cones, acorns) - arrangements, figures.
-Leaves and needles - arrangements.
-Weeds - arrangements.
-Reeds - weaving.

Generally, the craft activity is introduced by a hike to gain understanding and appreciation of the particular material chosen.

The craft hike is often within the boundaries of the state park and consequently does not include the collection of craft materials. Craft collection is sometimes carried on in connection with such activities outside the park as conservation work projects and all day exploratory hikes.

One of the major purposes of the outdoor education program is to increase appreciation of nature's handiwork. Firsthand experiences in the outdoors provide many opportunities for creative work and emotional expression.

Children become aware of the beauty in nature through:

-Design

- Shape of trees, twisted chaparral, leaves of plants, flowers, cones, bark, and shadows
- Different patterns of snowflakes (winter)
- Indian symbols for clouds, rain, sun, and so forth

-Color

- Sunset, clouds, birds, leaves, rocks

-Composition

- Always present, always changing from scene to scene

-Perspective

- Distant views, effect of distance on color, sharpness of focus

-Texture

- Feel of velvety moss, rough granite, smooth fungus, polished rock

A NEW APPROACH TO CREATIVE EXPRESSION

One of the fixed ideas that limits creative expression in sixth-grade children is that the result of their efforts must conform to the ideas of others. There is too much emphasis on the art of representation. If the figure does not look like a horse to others, then the artist has failed. Since it is very difficult to represent things accurately and without fault, the artist is faced with feelings of failure which tend to repress his creative expression.

In the outdoor education program much can be done to free children from creative repression that results from over-concern for representation that is acceptable to others. In the new environment in the mountains, guided by a new set of adults, working with new tools in a media that is unfamiliar to them, the children are psychologically ready for a new approach to creative expression.

Their ties with past patterns and attitudes in art experiences must be severed for the moment. Their attention must be diverted from their own self-consciousness to a new center of focus. They must be helped to forget themselves and their inhibitions through concentration upon the new material with which they will be working.

Fortunately, the new materials have proven to be of great interest to children. Interest and appeal to youngsters can be found in the following experiences with the new media:

-Finding and making their very own clay
-Carving in solid rock
-Working with strange and beautiful pieces of wood

In the orienting approach to the craft activity the teacher should have a kit of sample materials to illustrate his points. The kit should include:

-Specimens of the craft media in the rough, natural state which were selected to show interesting shape or color.
-Specimens that have been worked on to highlight some special feature to be developed.
-Specimens in various stages of completion to show progressive treatment of materials.
-A variety of finished forms that suggest the freedom from any need to "represent" things.

WORKING FOR CREATIVE EXPRESSION

The suggestions for improving creative expression in rock carving which are outlined below can be adapted to other craft activities.

"You have shown an interest in working with rock. Why?"

"What do you know about this material?" Discuss briefly to encourage general participation in activity.

"Why do you suppose artists work with different kinds of materials?"

-Each material has certain characteristics that the artist learns to recognize and develop.

-Some of the great artists today feel that they must be true to the nature of the material they are working with.

-These artists feel that they must give expression to the material. They must try to bring out the personality of the material. They must release the strength, beauty, life and freedom that is within the material.

"Look at this piece of rock. What do you see in it?"

elemental strength	massive ruggedness
stability	simplicity

"Would we want to suggest flight or movement with this rock?"

"What materials would better suggest flight or movement?"

mobiles
wire sculpture

"If we are to be true to the rugged strength and massive simplicity of rock, what kind of shapes will we want this rock to take? Tall, skinny or fragile?"

"What kinds of shapes suggest massive, rugged strength?"

Guide the children away from the idea of carving shapes of elephants or other specific things. Encourage the representation of ideas and feelings rather than actual figures in life.

"Now, let us look at the rock again."

"Does the rock itself suggest a shape? Look closely at any interesting suggestion of form that can be developed."

"What about the color of the rock? How can the rock be shaped to catch the light to show the color to advantage?"

Illustrate with samples from kit.

"What about the patterns of light and dark?"

"Is some of the texture of the rock so interesting that it should be left rough to contrast with the smoothness of the polished surface?"

Help the children concentrate upon revealing the beauty and character of the rock. Promote the idea of "free form" and of beauty for beauty's sake. Play down the tendency of children to want to make utilitarian or imitative objects.

Encourage all children to give this approach a try. If individual artists persist in their determination to carve a heart, cross or other conventional figures, do not belabor the point. Remember, the craft experience should be enjoyable, not forced or dictated.

For the most part, children will enjoy the new-found freedom of expression without fear of contradiction. No one can say that his free-form expression does not look like it should.

Clay Modeling

In the clay modeling activity the camper learns to use the lowly dirt he walks on to create beauty.

The clay activity includes an exploratory hike to discover, study and bring back to camp some native clay. The clods of clay are pounded, ground, sifted and processed for later modeling in the craft shop.

The objects fashioned in the craft shop may be fired later in one of the kilns in the schools.

Specific outcomes from the clay modeling project are that the child:

- -Gains fun and pleasure in working with clay.
- -Gains kinesthetic values in handling the plastic medium.
- -Learns about the nature and characteristics of clay.
    - . formed from decomposed granite.
    - . weathering of feldspar.
- -Learns about present-day uses of clay.
- -Learns how Indians of this region used clay.
- -Learns techniques and skills involved in preparing and modeling with clay.
- -Develops a feeling for line, mass, design and contour.
- -Appreciates good workmanship and the creative efforts of others.
- -Gains appreciations of the Indians' way of living.

Materials

Tools for digging clay.
#10 cans for collecting clay.
Canteen of water for testing for clay in the field.

Rocks to crush clay on. (Use the Indian morteros and manos found near camp.)
Screens for sifting clay.
Water for working clay.
Boards to work on.
Knives or sticks for modeling.
First aid kit.
List of campers.

Procedures

Orientation for sign up:

During Monday's tour of camp, children observe clay articles made by children as well as genuine Indian clay artifacts. Possibilities of clay activity are discussed.

In the camp museum, children see displays featuring how clay is formed and Indian artifacts.

Preparation for clay hike:

Gather group in clay shop. Discuss how Indians used clay; show samples. Study specimens of clods of natural clay to learn characteristics and clues for identification in the field.

"This is the stuff we are looking for."

"These are some of the tests we can use to check it."

-Texture when wet, plasticity
-Color
-Odor
-Foreign matter
-Appearance as a clay bank

Discuss hiking procedures for safety and consideration for others. Discuss exploring procedures. (Refer to All Day Exploratory Hike.)

Hiking in search of clay:

Look for an example of granite. Identify crystals of quartz, mica and especially feldspar, the source of clay.

The granite should be partially decomposed with quartz and mica still intact in the softening, weathering feldspar. Decomposition must have progressed to the point where clay is formed.

If clay is red, explain about stain of iron oxide and how Indians used it for color (hematite).

Discovering the clay bank:

As the teacher nears a known clay bank he should encourage the children to make the discovery. The teacher robs the students of an interesting experience if he takes the group directly to the clay bank.

To test the earth for clay, wet and rub between fingers. Is it sticky or plastic?

Collecting the clay:

Use principles of conservation in collecting the clay. Guard against soil erosion.

Carry clay back in #10 cans.

Preparing the clay:

Use these procedures for crushing and grinding to powder:

- In good weather use Indian morteros and manos.
- During inclement weather use metates or boards in craft shop.
- Sift powder to separate pebbles and foreign matter.
- Mix with water - just enough to hold clay together.
- Knead to get it smooth and even in texture and free from air bubbles.

Modeling with clay:

During the kneading process, show what the hands can do as they "squush" the clay. Stimulate imaginative thinking in helping the children see various forms which emerge as the clay is squeezed and moved about. Take plenty of time for this because of the kinesthetic satisfactions of squeezing the plastic mass.

Give individual direction and guidance as the children begin to develop ideas and to find their clay taking shape. Encourage those who are slow and help them think creatively.

Point out the techniques of workmanship necessary for the best results:

- Keep the clay damp, but not soggy -- firm enough to hold its shape, but moist enough so that it won't begin to crack.

- "Rough up" and wet the surfaces of pieces to be joined (such as animal's leg to its body); then "sew" up the seams with criss-crossing.

- Criss-cross and fill with "slip" (liquid clay) any cracks to be mended. Don't just smooth over the surface.

-Turn the piece frequently and observe it from above so that it will be satisfying from every angle.

-Trim off bumps with a knife and smooth the final surface with damp fingers.

Give suggestions about shaping animals:

-Visualize the live animal and think of the most important or distinguishing features--emphasize or exaggerate those features on your model.

-See that the general proportions resemble the live animal.

-Make the animal come alive by moving his head, tail or legs until he seems to be in action.

-Encourage children to try to "feel like" that animal to give them the right mood.

-Make the lines and opposing contours of the body clear cut and definite.

-When in doubt about some detail (the shape of nose, the way a leg bends), get help from a picture or from someone who knows the animal.

-Texture the surface to give the animal his hide or fur.

-Use some paint if color will help bring out the character of the animals.

Give suggestions about making bowls:

-Try the Indian method of building up a wall of coils on a "pancake" base; or, for a low walled piece, mold a strip around the base for a wall.

-Visualize the entire bowl as the walls are building up, molding them in the desired direction.

-Work for general proportions which are graceful.

-Incise or paint some designs of the type the Indians may have used.

Pace the activity so that campers finish their work on time.

Arrange modeled objects on boards attractively for drying.

Preparing the craft shop for the next group to use:

Do a thorough clean-up before the evaluation.

Evaluating the experience:

Encourage the children to show and discuss their finished or partially finished objects. Give constructive, encouraging remarks about each piece. Concentrate on the good points. Develop an appreciation for the work done by the camper craftsmen.

-Was it fun?
-What new ideas and skills did you learn today?
-Did we leave the tools and shop in good shape?

Rock Carving

Carving in rock has special appeal to children because it is usually a new experience for them.

The rock used in the rock-carving activity is alabaster gypsum. This is collected as needed by teachers and students.

The rock hike is taken with the idea of identifying and testing for hardness the different kinds of rock found. The hike usually follows a stream bed but may focus upon roadside cuts.

The expected outcomes are that the child:

- Expresses himself creatively in a new medium.
- Learns about the characteristics and origin of soapstone and alabaster.
- Learns and applies some of the tests for identifying rocks.
- Gains interests and appreciations about rocks that encourage rock collecting as a hobby.
- Learns to use craft tools safely.
- Learns how Indians have used soapstone.
- Learns current uses of soapstone and gypsum.
- Creates an artistic object to take home with him.

Refer to section in "Learning about the Natural Environment" for science learnings about rock and soil.

Materials for hike:

First aid kit
Field guide to rocks
Container for rocks
Rock hammer
Magnifying glass
Binoculars
Map and compass
Canteen
List of campers

Procedures for the Rock Hike

Orientation for sign-up:

On Monday's tour of camp, have campers:

- Observe rock and craft articles in craft shop.
- Handle native soapstone and alabaster.
- Examine craft tools.
- Hear brief description of rock-carving activity.

Rock displays in museum and cabin are of additional interest.

Preparation for rock hike:

Check the activity list of hikers to make sure no asthmatic children are included.

Take group to see rock display in museum for background discussion about rocks. Point out examples of the three main classifications of rocks.

-Igneous
-Sedimentary
-Metamorphic

Show examples of the kinds of rock found near the camp.

Study map showing rocks and minerals of area. Differentiate between rocks and minerals.

Discuss safety and consideration for others. (Refer to procedures for All Day Exploration Hike.)

Hiking in search of rocks:

On the hike:

-Use exploring techniques described in "All Day Exploration Hike."
-Emphasize rock study but also consider other aspects of nature.
-Describe history of mining and current mining operations.
-Explain that by cracking open rocks for study, the camper can see color and grain unaffected by weathering.
-Test hardness by scratch tests.

Scale of hardness

1. Talc
2. Gypsum
3. Calcite
4. Flourite
5. Apatite
6. Feldspar
7. Quartz
8. Topaz
9. Corundum
10. Diamond

Point out that a sharp pointed piece of each mineral will scratch a smooth surface of any preceding mineral, but not of one which follows. The softest rocks, like talc and gypsum, can be scratched by the fingernail; all below 6, by the point of a knife blade. A diamond chip may be used for the hardest. The last five will scratch window glass.

Collect representative samples of the hardness scale. (Remind students about State Park rules regarding collecting, and explain that these specimens will be returned.)

Discuss other characteristics of rocks and minerals, such as:

-Texture - does the rock feel smooth, rough, greasy?
-Crystal structure - can you see evidence of crystals with magnifying glass?
-Weight (specific gravity) - does the rock feel heavy or light in comparasion with other rocks?
-Odor - wet the rock and smell it. Does it have any odor?
-Transparency - can you see objects through the rock or mineral?
-Translucency - can you see light and shadow?
-Taste - does the rock or mineral taste salty, bitter, acid, alkaline?
-Luster - does it shine?
-Color - how can you best describe the color?

Try to identify the rock. Classify it as igneous, sedimentary or metamorphic.

Make many comparisons and references to the rock (alabaster, gypsum) they will be working with in the craft shop.

Build attitudes, anticipation and orientation for rock carving.

Carving rock in craft shop:

Materials

Kit of rock samples
Supply of rock
Coarse wood rasps
Brace and bits
Breast drills
Saws, coping
Saws, hack
Saws, crosscut
Motor with buffing wheel (to be operated by and accessible to leader in charge only)

Chisels
Hammers
Knives
Steel wool
Sandpaper
Wax or oil
Vises

All of the rock and cutting tools should be distinctively marked and kept separated from the woodworking tools.

Procedures for Craft Shop:

Orientation:

Gather the group in the shop. Recall significant aspects of rock hike. Discuss and demonstrate the safe use of each craft tool individually.

Discuss health and safety hazards unique to rock carving, i.e., inhaling dust. To guard against inhaling dust.

- Eliminate excessive dust in sanding.
- Do not shake sanding board in shop.
- Use sweeping compound.
- Work outside if weather permits.
- Work near exhaust fan.

Selection of materials:

Encourage students to:

- Select pieces about the size and shape of the objects they plan to make.

- Look for interesting features in the rock and capitalize upon them.

- Look for fracture lines where the rock may split. It may be wise to cause it to split before starting to shape it.

- Leave some natural rough finish to show off the polished portion if this technique proves effective.

Suggest some possible craft ideas but encourage the artists to select their own projects. Projects which have proved successful include:

- Jewelry
  - earrings
  - pendants (hearts, crosses, etc.)
- Paper weights
- Frogs for flower arrangements
- Book ends
- Ash trays
- Vases
- Figurines
- Centerpieces

Shaping the object:

Anchor the piece of rock securely.

- metal jaws of vise may cause stone to crumble.
- avoid undue sharp heavy blows that may cause the rock to split.
- dig cavity for bowls by first drilling many holes, then chiseling out residue.

Finishing the object:

Work progressively from coarse abrasives (coarse wood rasp) to coarse sandpaper, fine sandpaper, steel wool, and finally, when the counselor approves, the buffing wheel for a high polish. (Wheel used by teacher only.)

The natural beauty of the rock can be highlighted with a rubbed finish of wax or linseed oil.

Cleaning up craft shop:

This is an important part of all activities.

Evaluating craft activity:

Ask in what way was this an enjoyable experience. How could it have been improved?

Let each artist share his handicraft with the rest, explaining what he was trying to do. Try to say something good about each effort.

If some are not finished, explain when they might have an opportunity to finish them later in the week. (Encourage the classroom teachers to allow students to finish craft work in class.)

Caution students to take good care of their rock carvings; their school may want to exhibit camp crafts.

MUSIC

Music catches and expresses the spirit of outdoor living and camping. It provides a satisfying way of giving expression to the emotions growing out of the new experiences. Music also promotes and contributes to the spirit of adventure.

Many different kinds of music are found in the outdoor education program. The most obvious is singing. One of the advantages of singing is that, with built-in equipment, it can fit any occasion.

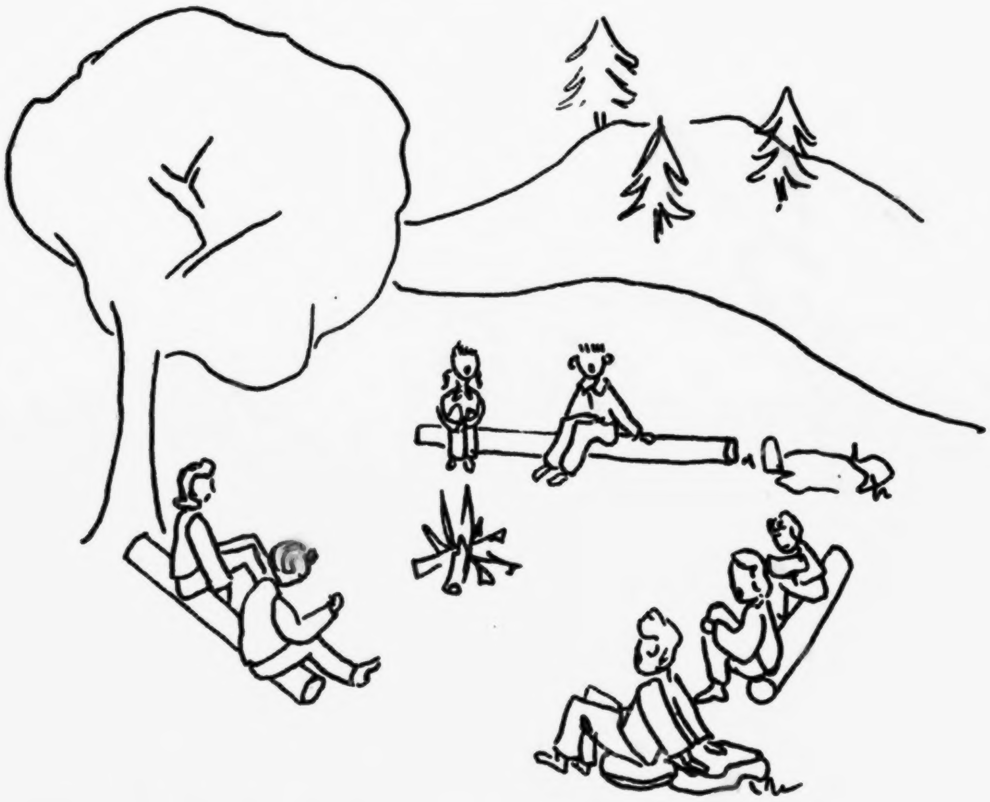
Singing that is a part of good camping includes:

-Singing to express the spirit of adventure

Camping is a time of exploration and adventure. The call of the outdoors with its promise of new horizons excites the imagination and quickens the spirit. Hiking along the upward trail furnishes the natural exhilarating cadence for a vigorous trail song. The song of the open road expresses the spirit of adventure in the out-of-doors.

-Singing in friendship around the fire

Camping is a time of good fellowship when friends join together around the campfire. The fire draws each camper closer to his fellows in a feeling of "oneness" that is enhanced as all join in raising their voices and blending them to create beautiful, satisfying harmony. Music at camp is a strong, unifying force.



-Singing for fun

Camping is a time for fun and happiness when joy and good humor tumble forth in rollicking verse and action. The sparkling, jolly action song adds to good wholesome fun. Singing can change labor to play.

-Singing to express the inner spirit

Camping is a time when the beauty of the out-of-doors lifts the spirit. Coming close to the wonder and mystery of the magic of nature helps each child feel himself to be part of the wondrous plan. The lifted spirit sings out in glory and in humbleness.

-Singing for love of country

Living in the outdoors is a time when the love of country, its strength and its abundance fills the heart with a feeling of loyalty and allegiance. "America the Beautiful," "My County Tis of Thee," express the feelings that grow out of a closer kinship with our land.

-Singing music of other lands

Camping is a time when children learn to understand and appreciate others who are different in race and religion. The music that reflects and expresses the heritage of others helps the children to know each other.

Some of the music in the outdoor education program is planned to set the stage for particular activities. Extensive use of phonograph records helps to set the tone for such activities as quiet time and bedtime. The camp program should provide time for rest and reflection. Soothing music subtly loosens the tightened muscles, relaxes jangled nerves, and releases the tensions of worry and concern.

Children should be led to discover and appreciate music in nature:

-Sounds of the wind in treetops
-Music of the brook
-Songs of birds
-Rhythmic symphonies of insects at night.

It is very important that some of the music in the outdoor education program came from the children themselves. The program should include opportunities for children to create their own music.

Techniques of Teaching Songs

All techniques and procedures for teaching and leading camp singing should be aimed toward providing increased pleasure, satisfactions and appreciations for the campers.

Singing becomes more pleasurable and satisfying if it is done well. Singing should be free from tensions and "labor." It should be spontaneous and enthusiastic.

Some of the things the song leader can do to improve the quality and pleasure in camp singing are:

- -Show enthusiasm and interest in the song.
- -Develop some facility in presenting and leading the song.
- -Be sensitive to the abilities and interests of the singing group.

Techniques of Presenting Songs

Setting the tone:

Guard against situations in which unnecessary discipline must be exerted to quiet the group and bring it to attention.

A very good way to circumvent disciplinary measures in making the initial approach is to start singing a catchy, familiar song with a small portion of the group nearest to you. The rest of the group will pick it up, and at the end of the song the whole group is centering its attention upon the leader.

An application of this technique is very helpful when children are gathering for a general meeting. Starting with a few of the early arrivals, the familiar song may spread so that children entering the meeting place come into a singing environment and become a part of the singing group.

Introducing the song:

- -Be sure you know the song well.
- -Give short story or interesting related information about the song. Most songs have an interesting background or tell an interesting story.
- -Explain unusual or difficult words so that the text will be understood.
- -Sing the song once completely through. Invite other camp teachers to join in singing. If the song is somewhat difficult, write the words so all singers can see them.
- -Teach the song as a whole if it is short. Otherwise teach in large portions.
- -Say the words clearly in proper rhythm and timing. Keep time with gestures.
- -Sing the words to children in the proper pitch. Use the gestures you will be using when you lead them.
- -Ask them to join as you all sing together.
- -Treat the next section in the same manner except to tie it together with the first section as a larger unit.
- -Do the same with the succeeding sections.

-Try to combine all sections together with no delay so that hearing the song as a whole will give feeling of progress and will promote interest.
-Give encouragement and work on the parts of the song that are rough.
-Work until the children can sing the song; but do not labor the song.
-If the song is difficult, be content with just one verse. Save the second verse for a later song session.
-Vary the song session so that relief from learning a new song is provided by singing familiar fun or action songs.

Leading the song:

Not all camp teachers feel that they are adequately prepared to teach and lead camp songs. A very successful method of inservice training and preparation for camp song leading is described below:

-Study methods of teachers who are successful in teaching music.
-Learn camp songs.
-Study and practice song leading techniques learned in staff meetings.
-Read reference material.
-At camp singing sessions sit at front and face the group while another teacher is leading songs.

. Project mentally into leader's position.
. Imagine that you are leading.

-Participate more at each song session.
-Make gestures with leader as he leads.
-Stand near him and other teachers and cooperate with them. Imagine you are alone.
-Gradually assume more of the leading responsibility.
-Go toward the rear of the group and give more decisive leadership to be of real help to the leader.
-Practice some of what you have learned with your own small cabin group. Do lots of song leading with your cabin group.
-Ask the song leader if you can present a song, with him supporting. Start with an easy, familiar song.
-Ask him to let you try it entirely alone. Use tone bells to get starting tone for proper range.

Suggestions for song leading:

-Try to appear assured and confident.
-Be decisive in your gestures.
-Always be sure of the pitch of your starting tone. Use tone bells, piano, harmolin, pitch pipe, autoharp or accordion.
-Wait until all campers are ready before attacking the song.
-Extend arms outward in an expectant manner and give a definite windup for a decisive starting motion.

-Lead the singers, do not follow.
-Use simple, strong motions and terminate with a good strong ending.
-Keep your standards high. Strive for improved performance.

Coordinating the Singing Program

With many camp teachers teaching and leading songs throughout the week, it is necessary to cooperate and coordinate efforts. Use the song sign-up sheet to indicate the song you wish to teach. Check to see which other songs have already been taught so that you can reinforce and continue rather than merely repeat them.

Procedures for Using Recorded Music:

-Sign up on Monday for the records you select and indicate the time you will want to play them.

-Check to make certain that the record player assigned to your cabin is in good working order.

-Have recorder and records ready before time for the activity in which you want to use them.

-Do not play any quiet music until the group is ready for it.

-Report any broken equipment immediately.

-Return equipment according to schedule.

M - Major
n - Minor

SONG SIGN-UP SHEET

DATE________________

Key	1st Note	Name of Song	Monday Evening	Tuesday Campfire	A.M.	P.M.	Wednesday A.M.	P.M.	Thursday A.M.	P.M.
		Allouette								
C-M	C	Angels of the Night								
		Aztec Lullaby								
		Battered Elm Tree, The								
C-n	D	Burr! It's a Cold Day								
D-n	A	Canoe Song								
G-M	D	Chaparral Song								
F-M	A	Cowboy Lullaby								
E-M	G	Cuckoo Song								
		Do, Lord								
		Down in the Valley								
B-M	F	Each Campfire Lights Anew								
		Friends (round)								
		God Gave the Wise Men								
G-n	G	Hi-Ho								
G-M	D	Home on the Range								
	E	I See The Moon								
E-M	B	I'm Happy When I'm Hiking								
		I've Been Working on the Railroad								
F-n	F	Indians of the Oaks								
		Jacob's Ladder								
C-M	G	Keeper, The								
C-M	G	Kookaburra								
		Lovely Evening								
F-M	F	Make New Friends								
		Music Over My Head								
		Now the Day is Over								
D-n	A	Old Man, Great Chief								
		Oil In My Lamp								
		O, Won't You Sit Down, Lord								
F-M	A	One, Two, Three (C chorus)								
		Peace, I Ask of Thee, O River								
F-M	C	Pick a Bale of Cotton								
D-n	D	Red Men, The								
		Rise Up, O Flame								
F-M	A	Rock-a-My Soul								
C-M	C	Sarasponda								
		Silver Moon								
F-M	C	Sing, Sing Together								
F-M	A	Sing Your Way Home								
		Smokey, the Bear								
E-M	B	Stars at Night, The								
		Swing Low								
D-M	F	Swinging Along the Open Road								
F-M	C	Taps								
F-M	C	Tell Me Why								
		Tramping								
E-M	B	Two Wings								
E-M	E	Upward Trail								
E	B	Vreneli								
E-M	B	Weggis								
		Where Is John?								
		White Coral Bells								
		Witchcraft								
C-M	C	Zulu Warrior, The								

DRAMATIC ACTIVITIES

Point of View

Dramatizing experiences has been part of camping since the earliest hunters told the story of the hunt through pantomime, dance and chant. Throughout the history of man, satires of war, important events and legends have been dramatized about the campfire. The earliest people in our own camping area, the Indians, developed the art of dramatizing events.

The many new and interesting experiences that the child finds in the outdoor education program give him ample background and motivation for dramatic interpretation.

The American heritage of sharing around the campfire suggests the ideal setting for dramatic activities.

Overview

Dramatic interpretation is not limited to a particular time or opportunity at camp. Imaginative thinking should be a part of all activities in the outdoor education program.

One of the best times for dramatizing is during the evening program around the fire (sometimes simulated).

In general, dramatizations at camp are very impromptu, growing out of the immediate experiences of the children and presented simply, with very few props.

Expected Outcomes

The child:

- Uses his imagination in expressing himself creatively.
- Shares experiences with others in a very enjoyable way.
- Works cooperatively in planning and preparing costumes, scenery and plot.

Materials

Costumes and scenery improvised by campers and leaving much to the imagination.

Procedures

Plan ahead with children for possible dramatic presentation of experiences while still participating in the experience. During a rest period on a hike, consider some highlight of the hike to dramatize later for the rest of the group, such as:

- Discovering an Indian Village site.
- A narrow escape.
- A humorous incident.
- A surprise.
- Stalking wild animals.

Planning dramatizations is also pertinent during other activities, such as conservation work projects, cookouts, etc.

Use the special interest period following supper to plan with your cabin group to present:

- An Indian legend.
- Charades depicting camp activities.
- Pantomimes of staff members. (be kind!)

Discourage the presentation of trite and overdone skits that are more appropriate in another setting. Discourage T.V. and radio takeoffs.

Encourage use of discretion, wholesomeness in choice of subject. Preview the presentation to insure that it is in good taste.

Keep the presentation simple.

FOLK AND SQUARE DANCING

Point of View

The tradition of our pioneer ancestors makes folk and square dancing a must in camping.

Overview

Folk and square dancing is done at camp:

- -During inclement weather when campers should not go outside.
- -As a campfire activity by a cabin group.
- -Every Friday morning for all children interested.

Ballroom dancing is not encouraged at camp at the 6th grade level.

Expected Outcomes

The children:

- -Express themselves through rhythmic motion.
- -Enjoy dancing with each other in a well-supervised and wholesome atmosphere.
- -Enjoy large muscle movement during bad weather which limits such movements outdoors.

Materials

Record player
Square and Folk dance records
Calls for dances

Procedures

Check to see that dancing area is clean and free from dust. Use hose for watering.

Keep in mind that dancing should, first of all be enjoyable. If the teacher labors the teaching to the point where the spirit of dancing is lost, he has defeated his chief purpose.

Teach only those dances that can be learned in a very short period of time. Intersperse well-known dances with new ones requiring teaching.

- -Be sensitive to childrens' interest span.
- -Select dances that are in keeping with the spirit of rugged, vigorous pioneer fun.
- -Exclude dances that are effeminate or too juvenile.
- -Provide enough rest periods.
- -Ask other teachers for their reactions to the effect of your

voice over the public address system.
-Enjoy yourself! Your enjoyment will be contagious.
-Use lots of humor, but no sarcasm.

CHAPTER XII

PARTICIPATING IN UNUSUAL-WEATHER ACTIVITIES

Unusual weather is "usual" in the outdoor environment at camp. It provides many opportunities for new and interesting experiences. Unusual weather should be considered as a time for different and special kinds of activities. It should not be thought of as a time of limited opportunity, a time to somehow endure.

Some of the activities that are reserved for unusual weather are:

-Rain hikes.
-Tobogganing.
-Skiing.
-Snow hikes and snow fights.
-Snow sculpturing.
-Camp parties.
-Tumbling and stunts.

Many activities normally conducted out-of-doors can be modified to be carried on indoors. Some of these activities are:

-Square dancing.
-Map and compass study.
-Ore panning.
-Science laboratory experiences.
-Craft activities.
-Motion pictures.
-Colored slide presentations.

Additional inclement weather activities are described in other sections of the guide.

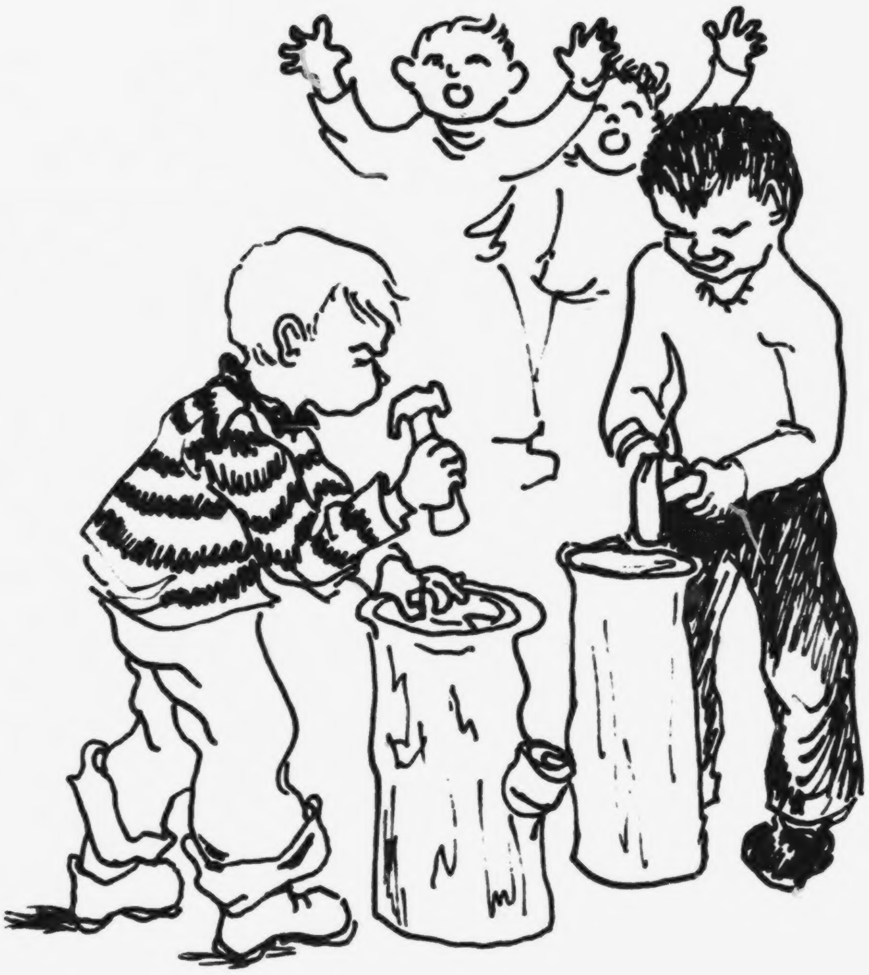
Special health rules must be observed closely during periods of inclement weather. Fortunately, there is an adequate supply of rubber boots and ponchos to protect the children from the weather.

During inclement weather, when children must remain indoors, it is necessary to provide a variety of activities that involve large muscle movement. There must also be opportunites for children to let off steam under good supervision.

Pleasant surprises add sparkle and gaiety to dull weather. At times it may be desirable to plan a large party involving all of the children. Some of the ways in which children may participate are:

-Decorating the hall.
-Preparing desserts (popcorn, candied apples.)
-Presenting a program of entertainment - - music, tumbling, dancing, skits, stunts, contests.

Preparing for the party can constitute a whole activity. When all of the activities are merged together - - a party!



TUMBLING

Point of View

Tumbling provides training in basic body movement that is of value in a wide variety of activities. Tumbling at camp provides an opportunity for children to exercise their large muscles and to meet the need for active movement.

Overview

For the most part, tumbling is offered as an activity to children when they are confined indoors by inclement weather. The tumbling activity is combined with a stunt activity so that experience may be had in both areas.

Expected Outcomes

The child:

-Finds a release through activity for pent-up energy.
-Learns how to handle his body in falls.
-Masters some of the skills of movement and balance.
-Appreciates the need for safety procedures.
-Understands the reasons for warming up prior to active exercise.
-Gains a sense of growth in poise and accomplishment.

Materials

Tumbling mats
Brooms
Whistle

Procedures

One of the secrets for a successful tumbling activity is a strong emphasis on form. It is not so much what you do as how you do it! Take time to explain the importance of form in tumbling competition. If possible, demonstrate a snappy forward roll with a proper approach to the mat, good entry into the roll, a smart finish, and departure from the mat. This sense of doing the exercise just so, together with a slight bit of ritual, will tend to discourage sloppy performance, habits and behavior.

Do not allow the tumblers to be satisfied with mediocre performance.

Keep the stunts very simple but strive for high standards of execution.

Begin the tumbling activity with a discussion of need for adequate warm-up exercises. Demonstrate several warm-up exercises and then give time for good, active warm-up. This may be the first time that some of the children have considered the need for warm-up.

Gather the group about the mat and discuss safety precautions and develop a set of safety rules:

-Restrict tumbling to the mat.
-Keep in line and wait your turn.
-Get off the mat promptly after completing a stunt.
-Do not begin to tumble until the person in front is clear of the mat and safe.
-Attempt only those stunts that have been demonstrated.
-Do not attempt the more difficult stunts without a "spotter" who will guide and insure safe performance.
-Remove all glasses, pins, bracelets, lockets, knives or other objects that may be harmful.
-Master the rolls thoroughly, since they are basic to other stunts.
-When you are tired, rest; do not tumble.
-Do not try to support heavy weights as in pyramids.
-Keep voices low so that all instructions can be heard.
-Be businesslike. This is not a time for horseplay.

Demonstrate each stunt on the mat while the tumblers are assembled so that all can see. Use some of the more accomplished tumblers as helpers in spotting and demonstrating.

Ask the tumblers to observe each performance carefully so that they can give helpful suggestions. (This sets a good clinical tone and reduces the tendency for horseplay.)

About halfway through the activity period there should be a change from the concentrated work on tumbling to the more informal and social play of games, team contests, relays, etc. Such activities as "Steal the Bacon" provide diversion from the more exacting stunts.

Informal contests between individuals such as hand balancing and hand wrestling also provide good diversion.

Some of the tumbling stunts and exercises suitable for the tumbling activity are:

Warm-Up exercises

Run in place
Log roll
Push-up
Inch or measuring worm
Arm stretch and rotations
Trunk flexion-extension
Windmill

Tumbling stunts

Falls - front, back, side
Front roll
Back roll
Head stand
Tri-stand
Frog stand
Hand stand
Hand-knee-shoulder stand
Shoulder mount
Cartwheels

Pyramid building

Combine some of the stunts that have already been learned so that they form an interesting pyramid pattern.

The following stunts have elements of danger that make them unsuitable for the camp tumbling program:

- Diving into forward rolls (danger of neck injury).
- Flips (danger of neck and back injury).
- Pyramid building that calls for lifting or supporting any weight greater than the tumbler's own.
- Any stunt that places undue stress on the knee joints, back muscles, abdominal muscles, arm sockets.
- Any stunt that calls for strenuous twisting.

The tumbling activity is not complete until the mat has been swept, rolled and stored. The activity should be concluded with an evaluation of skills and values gained from the activity.

SNOW ACTIVITIES

Point of View

Snow brings the excitement, fun and thrill of new experiences and adventure.

The nature of snow and ice and the kinds of activities associated with them create serious safety hazards. The safety hazard is increased because San Diego children have not had much experience with ice and snow and do not know how to take care of themselves while participating in snow activities.

Overview

Some of the activities planned to be carried on in snow are:

-Tobogganing
-Skiing
-Snowball fights
-Tracking in snow
-Exploratory hikes
-Snow sculpturing

Expected Outcomes

The child:

-Keeps safe and well.
-Learns skills of safety.
-Develops desirable safety and health attitudes.
-Gains skill and enjoyment in snow activities.
-Gains new appreciations and understandings about snow.

Materials

Suitable clothing
Toboggans (waxed and ready for safe use)
Skis
Trays for individual sliding
First aid kit
Dark glasses if available

Procedures

ORIENTATION TO HEALTH AND SAFETY HAZARDS

If snow is on ground when campers arrive at camp or as soon as snow falls during encampment, give orientation on safety hazards and appropriate behavior.

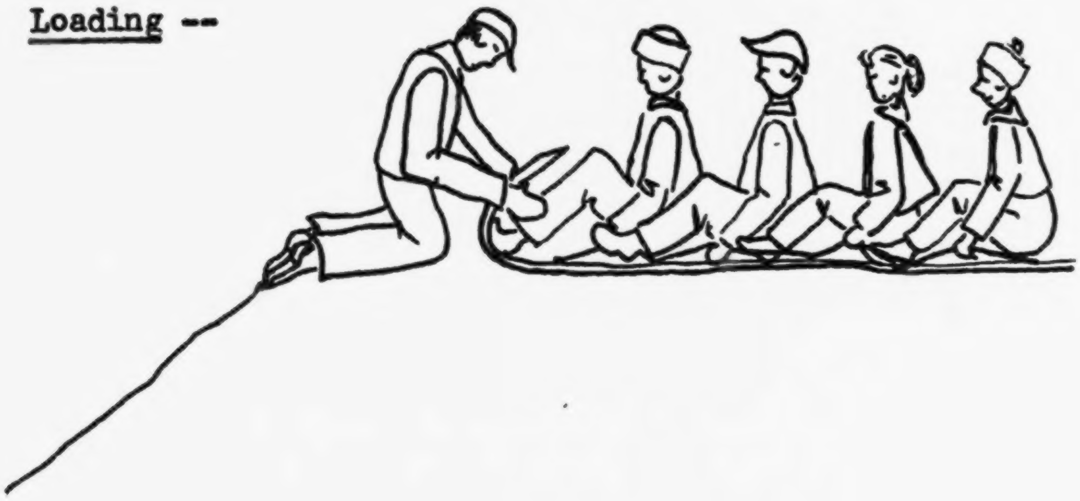
Health and safety hazards include:

- -Throwing snowballs.
- -Slippery footing on sidewalks and steps.
- -Improper clothing.
- -Improper footgear.
- -Eating of snow.
- -Walking in mud puddles.
- -Review these hazards before engaging in planned snow activities.

ORIENTATION FOR SPECIFIC SNOW ACTIVITIES

Tobogganing:

Loading --



Demonstrate on a table proper procedure for loading.

Do not use toboggans unless there is an ample amount of snow.

Someone should be selected to sit in front to give cue on how to lean.

Anchor the toboggan securely until ready for slide. One counselor makes sure it is anchored and another one supervises loading.

For safety's sake --

Sit, don't stand, on the toboggan.

Don't sit on spine or on slats of toboggan.

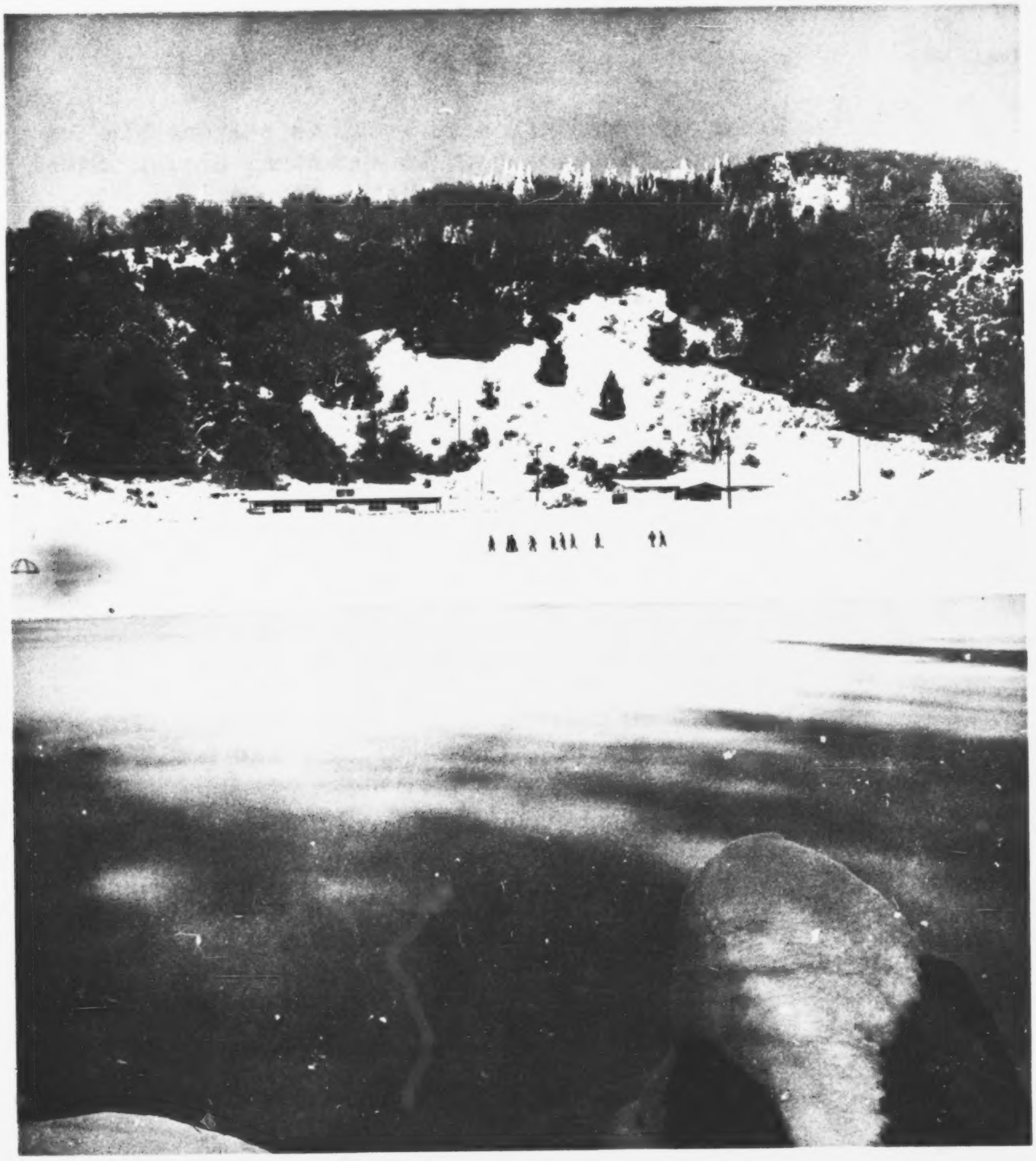
Don't overcrowd the toboggan.

Don't put the rope around a child's body.

Check dangerous hazards (fences, ditches, rocks and so forth).

Check hands to see that they will not cut or scrape against hard snow and ice.

Don't allow feet to drag or catch on snow. Secure feet by hands.



Sliding --

Keep the slide area clear.

It is dangerous to climb up the slide area. Walk up designated path away from slide.

Steer away from jumps entirely.

Demonstrate how to spill if there are objects in the toboggan's path.

Caring for toboggans --

After tobogganing, each group is responsible for waxing and returning the toboggan to a central place. Stack toboggans flat so that there will be no warping.

Report any unsafe conditions of toboggans.

Snowball throwing:

Give an impressive orientation on the kinds of snowballing permitted:

-No ice, gravel, etc.
-Aim below the waist.
-Only throw in designated areas

Organize a snow-war game:

Divide the group evenly into two sides.

Decide upon playing area with a dividing line separating the two teams. (Variation: building two forts adds interest.)

The signal "Fire Away" begins the game, and "Hold Fire" stops the game.

When a person is hit directly by a snowball, he must drop out of the game except for making snowballs for his team.

The game ends when all players on one side have been hit, or after a time limit.

The winner is the team with the most "throwing" players remaining.

Organize a "Fox and Hounds" game:

One small group of children with a teacher starts off through the snow to locate a spot in which to hide.

The "Hound" group starts 10 minutes later and attempts to track the "Fox" group.

The meeting of the two groups results in one big snowball fight.

Skiing:

Equipment needed --

Skis with cable bindings. (Ski poles can be improvised by sawing old broom handles.)
Leather or rubber boots.
Warm, loose clothing.
Ski wax.

How to care for the equipment --

Skis should be well waxed with a basic ski wax before using.

After skiing, skis should be wiped off with a dry cloth, and the equipment stored in a dry, cool place. Any unsafe conditions of the ski equipment must be reported.

At the close of the skiing season pairs of skis should be strapped together with 2" x 4" block of wood placed between the runners.

How to fit the skis --

It is important that the skis fit on the boot as tightly as possible.

Loosen the cable bindings and lengthen or shorten them if necessary. Use a screwdriver to get correct width of the toe plate.

Kick into skis and pull back of cable over head of boot. Clamp down the cable bindings.

How to use the equipment --

Ski poles should be used as an aid in walking, climbing, holding on a hill, or for balance when skiing. Ski poles should never be used as an aid in stopping.

Poles should be held close to skier's hips and extended toward the back.

Skis should be kept from crossing to avoid strain on ligaments and muscles.

The skier must always maintain control over his skis and poles. Therefore, it is important that he doesn't choose slopes too difficult for his ability.

How to fall without injury --

If the skier feels himself about to fall, he should squat low to the ground and fall slightly to one side.

If a skier finds an obstacle in his path or is unable to get his skis under control, he should not hesitate to stop himself by falling. The skier should get up quickly by putting his skis parallel across the slope, rolling onto his knees, and pushing up with the poles.

Basic skiing position --

Skis should be parallel, about 6 to 8 inches apart, one ski slightly ahead of the other. The body should be in a relaxed position, slightly crouched with body weight carried forward on the balls of the feet.

Arms and poles are held close to the hips, with poles extended backward.

How to walk on skis --

To move forward:

- Assume basic skiing position.
- Slide skis along the top of the snow.
- Move with a four-count rhythm.

1	2	3	4
left	right	left	right
slide	slide	slide	slide

- Push with the poles behind the skis in order to get added power.

To change direction:

- -Make a clockwise turn taking very small side steps.
- -Do not cross skis.
- -When necessary, use poles in front of or behind skis to keep from sliding.

How to climb with skis --

Herring bone -- to be used on easy slope:

- -Toe out with skis (duck walk).
- -Use inside edges to grip in snow.
- -Push behind skis with poles.

Side step -- to be used on steep slope:

- -Keep skis parallel and across the hill.
- -Keep the same ski in the lead while climbing.
- -Take very small side steps.
- -Use poles to keep from slipping forward or backward.

How to run straight down a hill --

Pick an easy, long slope with a cleared flat area below.

Assume basic skiing position. Push body weight forward while sliding.

Keep body in a semi-crouched position at all times, with the body weight evenly divided on both skis.

Look twenty feet ahead of the skis.

How to slow on a hill --

From a straight downhill run, spread the backs of the skis into a snowplow (pigeon-toed) position. The wider the spread, the greater the slowing action.

Be sure the tips of the skis do not cross and that the weight is carried on the balls of the feet and evenly divided on both skis.

The body should be crouched with the knees in a knocked-knee position.

How to stop --

From a straight downhill run, first slow with a slight snowplow, then extend the slowing process into a wide snowplow.

Finally roll weight onto the inside edges of the skis until the edges are cutting deeply into the snow.

How to turn --

For a snowplow turn to the left:

- -Slow down with a wide snowplow when approaching the place to turn.
- -Reach down with the right shoulder and arm toward right ski.
- -Put body weight on right ski and ride around to the left.

For a snowplow turn to the right:

- -Slow down with a wide snowplow when approaching the place to turn.
- -Reach down with the left shoulder and arm toward left ski.
- -Put body weight on left ski and ride around to the right.

Snow sculpturing:

This is a quiet activity, so check for chilling.

Move to an area away from toboggan and snowball area.

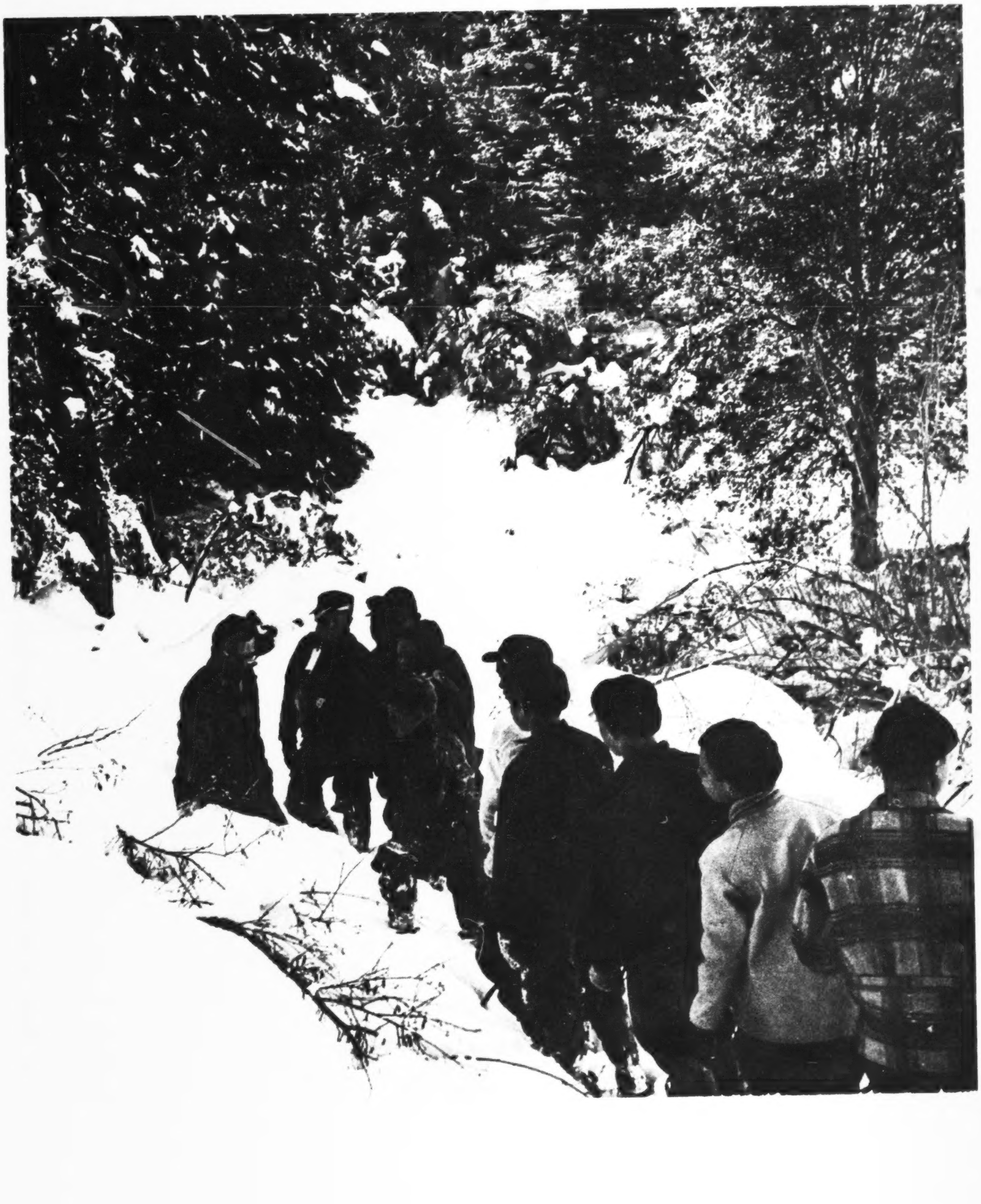
Procedures for snow hikes:

Keep in mind the objectives of regular hikes - exploring and adventuring.

Discuss the animal's relationship to the snow - how they obtain their food, their tracks, etc.

Try to capture the spirit of "fairyland surroundings." Point out the different designs made by the snowflakes. Mention that no one has ever found two flakes alike.

Upon returning from the hike, let children start making six-sided designs.



CHAPTER XIII

EVALUATING OUTDOOR EDUCATION EXPERIENCES

The outdoor education program is evaluated in many ways and by many persons. Such evaluation has proved to be a most helpful means of guidance in the development and refinement of the program.

The most severe critics of the outdoor education program are the members of the camp staff themselves. In a program where experimentation is being carried on continuously, it is necessary to provide for opportunities for the objective evaluation of innovations. The bi-weekly staff meetings have been, perhaps, the most important means for continuous evaluation.

Each classroom teacher and student teacher is invited to make an oral and a written evaluation of the program he has participated in during his week at camp.

During the last evening program at camp, the children are encouraged to evaluate their experiences. In addition, various tests of knowledge are developed which provide evidence of the effectiveness of the instruction program.

The parents are able to judge the value of the program from the post-camp learnings and attitudes that are observed at home. Parents also have an opportunity to form opinions about the outdoor education experience from the post-camp programs that are presented at school by the returning classes. These programs provide a means of sharing the students' enthusiasm and newly-acquired skills and learnings with others.

From time to time a school district may decide to carry on an evaluation program for its own purposes.

Two of the evaluation opportunities for children are presented in the following descriptions:

-The last campfire
-Questions for children

THE LAST CAMPFIRE

Point of View

Children need opportunities for reflective thinking. They need to have a chance to speak openly and sincerely in a climate of sympathetic understanding about personal observations that they normally hesitate to discuss with others.

Children need to be encouraged to look for underlying reasons for behavior. They need to learn to try to understand themselves and their peers. They need to have experience in viewing behavior objectively.

The last night at camp provides opportunities to help children in many ways.

Overview

On Thursday evening the children meet in cabin groups around campfires to discuss the experiences they have shared together during the week. In some of the camps it will be desirable to group two or three of the small cabins together to be treated as a larger living unit.

The length of time for the meeting will vary from 30 to 50 minutes.

These meetings have commonly been referred to as evaluation meetings because emphasis is placed on helping campers evaluate the week's experience. However, the last campfire program is much more than an evaluation session. It is a time when campers meet in a spirit of goodwill, fellowship and rapport to discuss problems and opportunities of living well together.

Expected Outcomes

The child:

-Enjoys a sense of rapport with his fellows.

-Adopts a constructive, positive approach toward helping others.

-Learns to withhold judgment until he gives objective consideration to all evidence.

-Increases his insight into his own behavior and feelings.

-Begins to recognize "problem behavior" as symptoms of deeper personal problems.

-Gains in desire and ability to make some contribution to the discussion.

-Gains a clearer idea about the values of the outdoor education program as a phase of his educational program.

-Sees relationships between school and camp that will lead to a greater insight and will enrich post-camp experiences.

-Learns lessons in living together that can improve his relationships with his family.

-Expresses constructive suggestions for improving specific aspects of the outdoor education program.

-Thinks creatively in formulating and expressing his ideas.

Materials

Candles or other means of simulating a campfire if a real campfire is not available.

List of rules, decisions or guidelines developed by the group.

Hair pads for seats on the floor.

Procedures

Plan in advance:

Planning for the Thursday evening campfire meeting should begin on Monday as the children arrive. The camp teacher will begin making written and mental notes of clues that will aid him in understanding the needs of the group. He will discuss his impressions with his coworkers in order to be prepared to help the children grow in attitude, behavior and understanding themselves.

During the cabin orientation discussion, the teacher will continue his preparation for the last campfire. He will inform the cabin group that the goals and guidelines they formulate on Monday will be discussed later in the week during the last campfire meeting.

Throughout the week the teacher will be sensitive to any leads that might indicate need for growth in attitudes and behavior. The teacher will consider such needs as he develops his list of objectives for the Thursday evening meeting.

The objectives for the Thursday evening meeting will vary in points and degrees of emphasis with the needs of each group.

Establish tone:

The most important aspect of a successful final pow-wow is the development of a spirit or "tone" that encourages the camper to feel:

- Secure in being with friends. He has come to know his teachers and his fellow campers well through the intimate give-and-take of large family living and through the sharing of many experiences.

- That he is a part of a very special experience. He finds an emotional and spiritual identification with the American heritage of explorers and pioneers gathered around the campfire at the end of a worthwhile common endeavor.

- Trust in being able to express personal thoughts without fear of ridicule.

- That honesty and sincerity are the watchwords in the discussion.

Set the stage:

The physical setting can contribute greatly toward achieving the desired tone for the last pow-wow.

- Plan for a good audience situation. Arrange the seating so that every person can see and hear every other person.

- Promote a feeling of unity in the group.

    - As far as possible seat the children in a complete circle so that everyone feels that he is a part of the circle and group.

    - Sit around a campfire or around flames that simulate campfires. The flame adds unity by providing a common center of interest.

    - Arrange for students from one school to sit next to students from other schools.

- Develop a theme for the setting.

    - Sharing ideas around the campfire as man has done throughout history.

    - Make use of symbolism. Let each candle represent some major contribution or trait of the outdoor education experience such as Learning, Friendship, Cooperation, Work, etc.

-Guard against interruptions during the meeting.

- Encourage all children to go to the bathroom just before the meeting.
- Separate children who might contribute to each other's distraction.
- Select a meeting place that will not be disturbed by traffic.

Make a good approach:

The teacher can do much to promote a desirable tone by observing the following techniques:

-Have the children come to the meeting area quietly and in good order.

-Make effective use of voice. The teacher's voice is an important factor in establishing the tone of the meeting. Use a matter-of-fact, businesslike manner in taking care of seating and final details of preparation. Use a warmer, more expressive quality of voice in developing the theme for a meeting. A friendly, sincere, interested voice contributes to the success of the pow-wow.

-Encourage an informal, personal atmosphere.

Encourage active student participation:

Use whatever outline you may feel you need as a flexible guide rather than a blueprint to follow. Be ready to move into areas of discussion that you have not anticipated but try to relate the ideas to one of the objectives for the meeting.

Guard against formalizing and stiffening the atmosphere by introducing an overly strong statement on rules and behavior at the outset of the meeting.

Be careful in using devices for symbolism or analogy so that they do not overstructure the meeting.

Lead with simple questions that are easy enough for all to answer, such as:

-"What did you enjoy most about camp?"

-"If you could remember only one thing about camp, what would it be?"

Guard against overt teacher-domination. Let the children feel that this is their meeting. Refrain from using such comments as:

-"I would like for you to . . . . . ."

-"I want you to . . . . . ."

-"I think . . . . . ."

-"That is the word I wanted you to say."

Refrain from passing judgments on their comments too often. Let the evaluation be theirs rather than yours.

Promote a feeling of successful participation by children. When a child offers a reply that is not correct, do not discourage him by answering, "No, that is not correct." This will often dull the enthusiasm, not only of this child, but also of others in the group. Try to find some element of truth in his reply and build upon it. Or, give recognition to it as good thinking and use it as a means of involving others more deeply in the discussion.

Discourage a conversational monopoly by a few and attempt to draw out the more retiring child. Be sure that questions directed to shy children are easy enough to insure successful answers.

Promote creative thinking:

Creative thinking is more than a way of arriving at ideas; it is an end in itself.

Use questions that are thought-provoking. Phrase your questions so that they cannot be answered solely with a simple "yes" or "no." Be sparing in the use of questions that merely ask for the recall of a particular word.

Challenge assumptions and ideas based on shallow thinking.

Encourage controversy. Differences of opinion can contribute to good creative thinking under the subtle direction of the counselor.

Help the children to arrive at new generalizations, and to gain added perspectives and deeper insight.

Encourage constructive evaluation:

Some children tend to be very critical of themselves and their fellows. They may clearly see that they have fallen short of living up to the letter of the rules they established for themselves. Were the group to concentrate upon failure, they could come to feel that the whole week was a failure.

The teacher needs to help them realize that it is possible to fail in specific ways and still have a very successful experience. It may be that the rules and goals were unrealistic. This should be considered. Perhaps the failure was limited to but a few children. A vocal minority may give the impression of representing the whole group.

If the failures were more in evidence during the beginning of the week, help the children look for evidence of improvement as the week progressed. Emphasize the progress that was made. How was the progress achieved? What was learned that would help if camp lasted another week?

If a teacher finds it difficult to redirect a phase of the discussion that is yielding only negative results, he should feel free to terminate that phase by introducing an entirely new subject.

Help children identify important values and concepts:

After participating in the kaleidoscopic program of outdoor and camp activities, the child is filled with many merging impressions and interests. Many of the goals, values and concepts have been submerged in the excitement of the activities of the program.

There is need to help the child see the activities more clearly in relationship to the goals and concepts established for them. There is need to help him understand the important values of his experiences.

Some of the concepts which can be appropriately developed at this time are found in Chapter I, where they are expressed as major outcomes of the school camp program.

Leading questions that can be used to guide and direct the pow-wow discussion are:

Feelings about camp --

-What is the most important thing you have learned this week at camp?
-Why do you feel it is important?

Learning about ourselves --

-Have you learned anything about yourself this week that you did not know or were not aware of before?
-What did you learn?
-How did you feel when you first arrived at camp?
-How many of you felt a little uncertain or apprehensive?
-Have you learned that most of us are pretty much alike?
-Have you sometimes worried that maybe you are quite different from others? (The fact that you do worry makes you more like all the rest of us.)

Living together --

-Did the guidelines and rules we developed help us have a better week? Were they helpful?
-How did they help?
-Were they good rules?
-What changes would you suggest?
-Did we follow the rules reasonably well?
-Did we improve in accepting responsibility for following the rules as the week progressed?
-Has democracy really worked at camp? Explain.
-What have we learned about living together in harmony?
-How can we use these lessons in improving harmony at home? At school?
-What did you think about these cabins when you arrived on Monday? How do you feel about them now? Explain the difference.

Friendship --

-Did you make any new friends this week?
-How did you go about it?
-What are some simple rules for making friends?
-Do all people really want to be friends? Discuss.
-Did any of you observe another camper do a helpful, friendly thing for anyone else? Tell us about it.
-Why are friends important?

Work --

-Did you enjoy the work you did this week?
-Why did you enjoy it?
-What makes work fun?
-What have we learned this week that might make work at home more fun?
-How do you feel when you do work that is helpful to others?

Boy-girl relationships --

-What are some of the things you have learned about boys and girls this week?
-Why do you suppose boys and girls often act silly around each other?
-Why do they sometimes tease and even hurt someone they really like? (Desire to be noticed.)

If the occasion warrants furthur discussion of boy-girl relationships, you may want to develop some of the ideas expressed below. This approach is designed for presentation to boys. It might be modified for presentation to girls.

"One of the most wonderful things in life is God's plan for continuing life. There is nothing more beautiful than the relationship of a mother and father having a family and caring for them. Everything about the relationship is beautiful; the love of husband and wife, the love of parents and children, the love of brothers and sisters.

"Each of you will want to find a mate you can cherish and love. You will want to find someone who will be good and fine. Even now you have in mind some of the qualities of purity, generosity and understanding that you hope to find in your life-long partner.

"It is not too early for you to be asking yourself this question: 'Will I be able to offer the things that I am looking for in a partner? Will I be honest, sincere, courteous and clean-minded? Will I have a wholesome respect of the idea of love and marriage?'

"As each of you graduates into junior high school you will meet many older boys and girls. Some of these young people may have distorted ideas about boy and girl relationships. They will try to impress you with their 'wisdom' and 'experience'. They may expose you to smutty, unwholesome ideas. They may make fun of you and try to get you to be one of them. They may make it uncomfortable for you if you do not go along with them.

"They may present temptation that will require courage on your part. Sometimes you will have to stand alone. But if you are standing on the firm knowledge that you are right, the so-called friends you may lose might well be replaced by friends of better judgment and character.

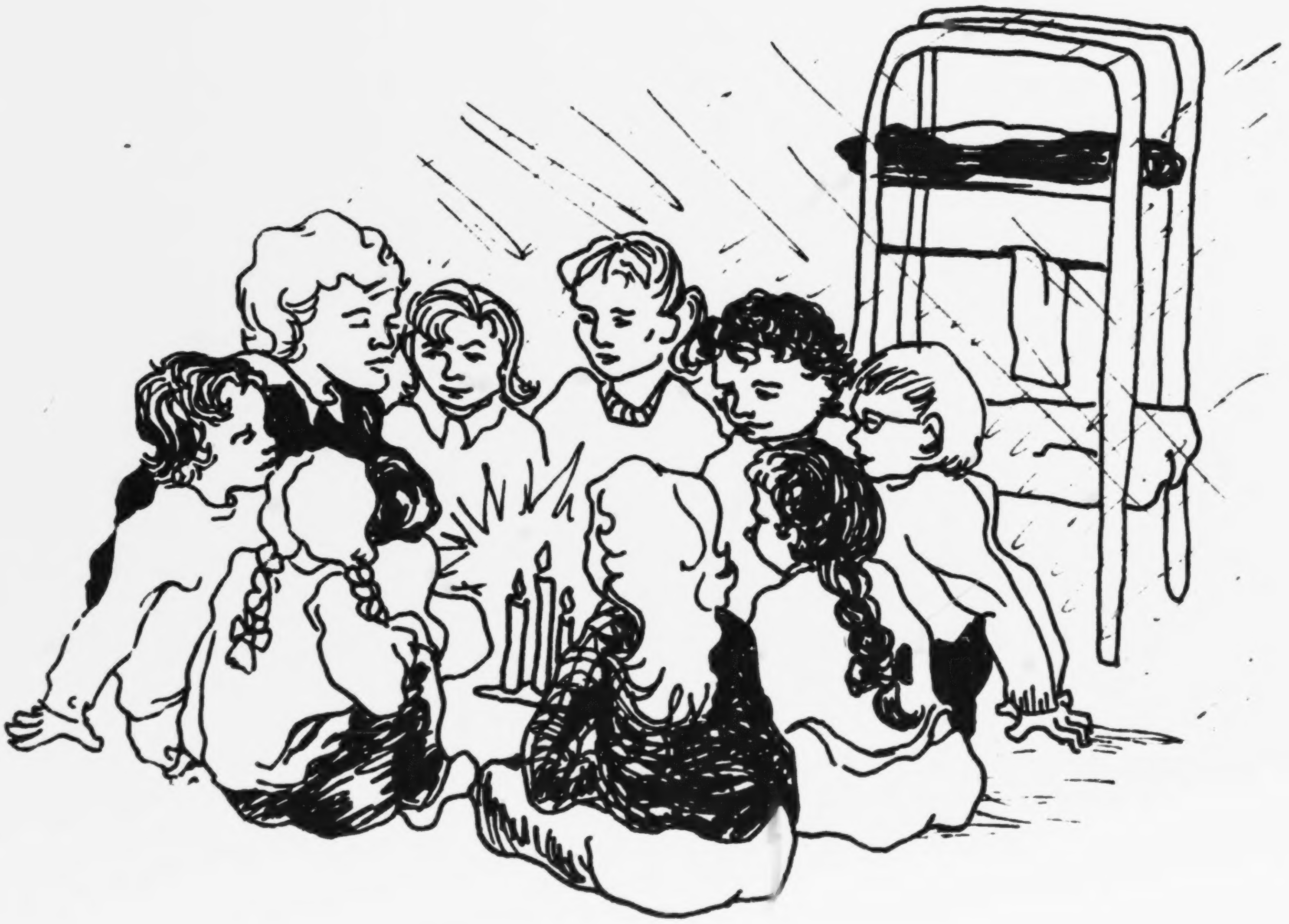
"As you associate with other boys and girls keep in mind that it is not sissy to behave like a gentleman. Others may be looking for leadership that you demonstrate in showing courtesy, consideration and respect for girls."

Concluding the pow-wow:

The pow-wow is brought to a conclusion before the children get restless. It is better not to wait for the sleep-in teacher to arrive if it means dragging out the meeting, since this detracts from its effectiveness.

The meeting is ended by asking the campers if they would like to hear the teachers' opinions about the children.

This is the time to think about the good things that can be said about the group so that the pow-wow will end on a constructive, optimistic tone.



QUESTIONS ASKED BY STUDENTS

The following list includes many questions that are sometimes asked by children. Can you answer them, and answer them in terms that can be understood by sixth grade children?

Go ahead. Give it a try!

Air and the Weather

What is weather?

How is weather measured?

What instruments are used to measure weather?

What is air?

What is wind?

Why isn't the oxygen in air used up as plants and animals breathe it?

Why doesn't the air become filled with the carbon dioxide we breathe out?

Why is there more rain in the mountains than near the coast?

Why are there deserts to the east of the mountains?

Why does it get colder in our county mountains than in our lowlands?

Soil, Rocks and Minerals

What is soil?

What are the three main groups of rocks?

How is a mineral different from a rock?

How is rock changed to soil?

What is a soil profile?

How do the following help to make soil: air, water, temperature, plants, animals, insects?

Where do the minerals in our bodies come from? How?

Erosion

What is erosion?

What are the chief causes of erosion?

How does vegetation covering the ground help to prevent erosion?

Does water cause erosion at a faster rate when it runs over steep slopes or over level land? Why?

How do rodents contribute to erosion?

Water

What is water?

Water is found naturally in three forms or conditions. What are they?

It is said that the ocean contains many minerals. How did they get there?

What is the "water cycle"? How does it operate?

Plants

How do green plants get food?

Why are leaves important to plants?

How do roots help plants?

How does the trunk or stem help plants?

How do flowers help plants?

Do plants breathe? How?

What causes the "annual growth rings" that can be seen on a fresh tree stump?

How do trees prepare for winter?

How do plants in the mountains help us get a drink of water on the farms?

How do plants help animals? Birds? Insects?

Why do plants need animals? Birds? Insects?

How do plants reproduce themselves?

What is a lichen? How does it get food, water?

How do mushrooms, molds, and other fungi get food?

Animals

What is an animal?

What is meant by a "food chain"?

What is meant by "balance in nature"?

In what ways are animals able to protect themselves naturally?

Could animals exist without plants? Explain.

How are leaves helpful?

Can trout hear? See? Smell? Drown?

How are snakes helpful?

What are the four stages of the life cycle of an insect?

Geography

In what mountains is our camp located?

What is the name of the larger range of mountains in which all three school camps are located? (Peninsular Range)

What is a watershed?

What is a divide?

What is a mesa?

Why do we find different kinds of plants and animals at different elevations?

The Heavens

What is a planet?

What is a star?

What is a satellite?

What is a nebula?

What is a constellation?

What is a galaxy?

What is a light year?

What causes night? Day?

Why is the sky blue?

Why is the 200-inch mirror of the Palomar telescope made of Pyrex glass?

What is the purpose of the mirror in the telescope?

APPENDIX

A GLOSSARY OF TERMS

algae	Simple plants that live in water and contain chlorophyll.
alabaster	Compact, massive gypsum.
astronomy	The scientific study of heavenly bodies and their motions.
atmosphere	The air that surrounds the earth.
axis	The geometric line around which a turning body revolves; as, the axis of the earth.
azimuth	An arc of the horizon measured clockwise from North to the vertical circle passing through the center of an object.
back-cut	The final cut which allows a tree to fall in the direction of the undercut.
bedrock	The solid rock underlying surface layers of soil and subsoil.
berm	A raised ridge of earth or other material that diverts and channels water run-off.
buck	To saw a log into short lengths.
buff	To polish with a cloth buffing wheel.
bridge	That uncut portion of the tree between the undercut and back-cut which acts as a hinge when the tree falls.
cambium	The sheath of growing cells that adds to the girth of a plant by producing new phloem and xylem; the growing layer.
camouflage	A coloring pattern that conceals or disguises.
canopy	An overhanging screen, as of treetops, which forms the forest ceiling.
carnivore	A flesh-eating animal.
chaparral	A collective name which refers to the shrubs and dwarf trees that blanket many hills in California; it includes chamise, manzanita, and deer brush.
chlorophyll	Green coloring matter in plants having the ability to convert the sun's energy into food for the plant; one of the most important of food elements for plants and animals.
clay	A very fine powdery earth, chiefly formed from feldspar in the decomposition of granite.

climate	The average condition of weather over a long period of time.
community	A group of plants and/or animals living together and depending upon one another in a given area.
compass	A device for determining direction.
composition	State, manner, style or quality of elements being put together.
conservation	The wise use of natural resources, such as forests.
constellation	A group of stars in the sky.
contaminate	To pollute or make impure, often used in connection with water.
contour	The outline of a figure, body or mass; the lines representing such an outline.
cruiser	Timber cruiser; one who inspects forest land to estimate its yield of lumber.
crystal	External structure of solid minerals. The characteristic shape of a mineral is often an aid in its identification.
deciduous	A plant which loses its leaves annually and later grows a new set; e.g., maple, sycamore.
decompose	Separate into constituent parts, disintegrate, decay, rot.
divide	A ridge separating two drainage basins.
duff	The litter of dead leaves and small twigs that cover the forest floor.
dwarf	Stunted, miniature.
elevation	Altitude, height above sea level.
erosion	The wearing away of earth or rock by air, water, or changes of temperature.
evaporation	Changing from fluid to gaseous state.
evergreen	A plant, shrub, or tree which retains its green foliage throughout the year. It does not shed its leaves (or needles) until new leaves are formed. Examples: pine, live oak, fir.
fault	A fracture of the earth's crust; usually accompanied by vertical or horizontal shifting.
feldspar	A common mineral of granite. Its decomposition causes decomposed granite. It is a major source of clay.

fell	Or fall. To cut down, to fell a tree.
filter	To remove solid particles or impurities from water as it passes through porous soil.
fluoresce	Emitting radiation as the result of receiving radiation from a source - observed as glowing.
food chain	A sequence of food supply wherein some animals that eat plants are in turn consumed by other animals which then become food for insects, bacteria, etc.
fungus	A group of simple plants which contain no green coloring matter. They can live on dead or living material. Parasitic fungi can be harmful. Most saprophytic fungi, however, perform the service of contributing to the decay process which eventually produces soil.
galaxy	Swirling cloud masses of stars, island universes in space.
geology	The study of the structure and history of the earth.
gneiss	A metamorphic rock, generally made up of bands which differ in color and texture.
granite	An igneous rock composed chiefly of feldspar and quartz, usually with one or more other minerals; e.g., mica, hornblende, etc.
gully	A miniature valley or gorge excavated by running water.
gypsum	Hydrous calcium sulfate deposited by oceans in thick beds and used in soil conditioning and plaster of paris.
hazard	Risk, danger, peril; also source of rick.
heartwood	Hard, central part of tree trunk.
hibernation	To pass the winter in torpid or lethargic state.
humidity	The moisture content of the atmosphere at a given time.
humus	Decaying vegetation on forest floor; acts as sponge for surface water.
igneous	Rocks formed by the cooling and hardening of molten material.
insects	Invertebrates with three body segments and three pairs of legs; most numerous animal on earth. Egg - 1st stage in insect metamorphosis Larva - 2nd stage; the hungry stage Pupa - 3rd stage Adult - 4th stage in complete metamorphosis

interdependence	Reliance of two or more living things upon one another for survival; i.e., the interdependence of plants and animals.
kerf	The cut of a saw.
lichen	A combination of fungus and algae living together in a plant partnership. The combination is important since lichen grows in remote places and prepares the way for other plant development.
light year	The distance light travels in a year at a speed of 186,000 miles per second.
litter	Debris scattered on ground.
luminous	Shining, emitting light.
mammal	A warm-blooded vertebrate animal whose female suckles its young.
mesa	A flat-topped hill with steep sides.
metamorphic	Rocks that have undergone a change through heat and pressure.
meteor	A stony or metallic piece of matter that falls to earth from outer space (sometimes called a shooting star or falling star).
milky way	A streaky, hazy light in the sky made up of billions of stars and dark clouds of dust and gas. Our own universe is a part of this galaxy.
mineral	An inorganic substance that has definite characteristics that can be recognized.
mortar	A strong vessel in which substances can be pounded or ground; sometimes holes ground into rock.
orbit	The path in space along which a heavenly body moves about its center of attraction.
ore	Material which is suitable for mining to reclaim metals.
parasite	A plant or animal which takes its food from another living thing; e.g., a tick, dodder.
photosynthesis	The process by which green plants utilize sunlight in making carbohydrates from carbon dioxide and water.
pistil	The seed-bearing part of a flowering plant.
planets	Heavenly bodies that move around the sun in nearly circular paths called orbits. Greek "wanderer".

pollen	The male reproductive dust from the stamen.
profile	A vertical section.
psychrometer	An instrument for measuring water moisture in the air.
reproduction	The means by which living things produce more of their own kind and keep their species alive.
reptile	Any of a group of cold-blooded vertebrates.
revolution	Rotation, as about an axis -- especially, a complete rotation so that every part of the moving body returns to the position from which it started.
rotation	The action of turning on an axis or center.
saprophyte	An organism which takes its food from dead plants and animals; e. g., fungi, molds, and bacteria.
sapwood	The lighter, more porous and younger wood just under the bark. It serves to transport sap within the tree.
satellite	A smaller body revolving around a larger one.
scheelite	An ore of tungsten.
sedimentary	Formed from sediment such as mud, sand and gravel.
snag	A dead tree that is still standing.
soil	Finely divided rock material mixed with decayed plant and animal material, constituting that portion of the earth in which plants grow or may grow. A geologist might consider all the covering of the earth as soil; the farmer might consider soil as that land which can grow crops or pasture. The latter soil has four important characteristics: depth, structure, texture, and chemical make-up.
solar system	The sun and all the dependent bodies that revolve about it.
stamen	The male, or pollen-bearing part of a flower.
star	A glowing ball of hot gases.
symbiosis	The partnership of two different kinds of organisms, such as two plants or a plant and an animal in which both benefit; e.g., lichen.
temperature	A measurement of heat or cold.
terrain	The environment or setting of a place or area.

topography	The physical features of an area.
transpiration	Giving off moisture from green tissues of plants.
undercut	The notch cut to cause a tree to become off balance. The tree will fall in the direction of the undercut.
vein	A crack or fissure in rock that has been filled by mineral matter; usually by deposition.
venom	A poisonous fluid that certain animals secrete.
watercycle	A cycle involving accumulation, evaporation, condensation, and precipitation.
watershed	A region or area drained by a stream or river.
water table	A point below which the subsurface of the earth is soaked or saturated with water.
weather	The condition at a given time of the air or atmosphere that surrounds the earth.
wildling	Wild native seedling.